The Iron Age

INDEX TO READING MATTER PAGE 32

A Review of the Hardware, Iron and Metal Trades.

INDEX TO ADVERTISEMENTS PAGE 19.

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New Band Saw Mill.

Below is shown a new Band Saw Mill built by Benjamin & Fischer, Chicago, which possesses features of interest to lumbermen and wood-workers in general. Many attempts have been made in the construction of sawmills utilizing the band-saw principle, but all that have appeared in the past have left opportunities for improvement. The device which we illustrate is one of the most recent attempts toward perfecting a mill of the character mentioned, and that it has merits of no mean order is fully attested by the results of a trial made under the auspices of the Lumbermen's Association, in September last. Among the peculiarities of this machine may be mentioned the relatively small diameter of the upper wheel, which decreases the bearing surface at this point while increasing it at the driving point or on the lower and larger wheel. A tightening-wheel is also introduced at a point where the saw leaves the driving-wheel, intended for taking up the slack of the idle side of the saw, thus obviating the necessity of so intense a strain as is sometimes found necessary. A governor is also provided, the location of which is shown in the engraving. In sawmills of this class as ordinarily constructed the top and bottom pulleys are of the same size, but in this case, the upper pulley being the smaller, the governor operates to prevent it from becoming the driver, thus overcoming the tendency to buckle which would otherwise exist. The governor is run on a friction-wheel, resting on the saw blade at its highest point. If from any cause the speed of the saw slackens, the balls of the governor drop and raise a brake which, coming in contact with a wheel inside of the upper wheel and attached to it, instantly checks its velocity, at the same time exerting a powerful leverage upon the tightening-wheel, serving to tighten the saw and keep the slack where it belongs. Another purpose is also served. Inasmuch as the tension of the saw suitable for a small log will not be sufficient for a large one, or when knots are struck, there is the need of an automatic governing device to respond as occasion demands. In such cases in this machine it is asserted that the governor acts promptly and automatically. As an insufficient tension is likely to be produced by the slackening of the speed of the saw, the required tension is maintained by means of the governor until the proper speed is reached. At the exhibition of this mill mentioned the visitors found that the machine to be tested had been mounted upon a foundation consisting of two sticks of timber laid upon soft, wet ground, and as a result that the foundation was not of that character required for the heavy work of a sawmill. Notwithstanding this the saw was started and a number of logs were cut into planks and small timber. As a result of the trial the committee asserted that the mill seemed to work as well in the round log as in the cant. In one case a piece of Norway bark which was lying on top of the log was cut by the saw without in the least disturbing its position. The feed employed was 5 inches, and the saw is said to have done its work with a steady motion and that musical ring so sweet to the ears of practical mill men. We learn from the manufacturers that this mill has a capacity of from 30,000 to 40,000 feet of lumber per day, a result which, it is claimed, has never been reached by other band saw mills.

Gas Producers in Glass Works.—As stated in our issue of last week, the experiment of using waste coal in the glass furnaces has proved of great advantage. All of the factories in Bellaire are said to be now using at least half slack without changing their furnaces at all, thereby reducing the cost of fuel in no small amount. The coal used by all of the glass factories in the past has cost 5 cents per bushel, and it required from 3500 to 4000 bushels per week for each furnace. Now less than half that amount of coal is used, and the balance of the heat produced by the use of slack, which is given away at the mines, and the only cost attached to it is for transportation. Of course this will not last long, because to create a demand for anything attaches a value to it that the owner is quick to perceive, but it is not probable that the slack used will ever cost more than 2 cents per bushel; hence the saving to even the unchanged furnaces can readily be seen, while at the new furnace at the Crystal Window Glass Works everything has worked like a charm, and all who have seen it pronounce it a great success, superior in every respect to natural gas, except that the natural gas, if it could be depended upon, is more convenient to light and turn on or off, while the coal and air gas must be manufactured.

The latest addition to the Russian navy is the gunboat Bobr, built by the firm of Crichton & Co, of Abo, Finland. She is 187 feet long, 35 feet broad and 9½ feet deep. The displacement is 949 tons. The engines are compound and are to work up to 1000 indicated horse-power. The armament comprises one 9-inch gun, one 6-inch gun, six 9-pounders and two Hotchkiss cannon. The vessel is to steam at 14 knots. Among some innovations noted by the Cronstadt *Vestnik* are: Pipes to lead off coal gas from the bunkers to the funnel, automatic lubricators for lubricating all the machinery difficult to get at, and mechanism for regulating the action of the screw. The Bobr will be equipped and finished during the winter and be placed in commission the first thing in the spring.

American Wire Mills.*

BY JULES FRESON.

In spite of the great increase which has taken place during the past two years in the consumption of iron and steel wire, the United States are in a position to supply their own demand. There are about 40 wire mills whose total production is estimated to be nearly 300,000 tons. The following is the distribution of these works in the different States: Maine, 2; Massachusetts, 8; Rhode Island 1; Connecticut, 3; New York, 5; New Jersey, 2; Pennsylvania, 7; Maryland, 1; Ohio, 4; Illinois, 4; Missouri, 2, and California, 2. The most important works are the Washburn & Moen Mfg. Co., the Gautier Steel Department of the Cambria Iron Co., the Oliver Wire Co., of Pittsburgh, the Cleveland Rolling Mill Co., and the New Haven Wire Co. These five works represent about two-thirds of the American production. The West already possesses nearly a dozen large establishments which have commenced to manufacture considerable quantities. The greater number of the wire works quoted draw not alone iron and steel wire, but also copper and brass wire. Besides, there are in the United States nine wire works who make a specialty of the two latter metals.

Before going into the question of the manufacture of wire, a few words should be said on the many gauges employed in America. Those most used for iron and steel are the Washburn & Moen and the Trenton gauges, which approach one another very closely. The American, or Brown & Sharpe, gauge differs a little from them. We give as follows a few points of comparison with the Birmingham gauge and the new British Standard gauge adopted March 1, 1884:

Nos.	Washburn & Moen.	Trenton.	Brown & Sharpe.	Birmingham.	New British Standard.
	Inch	Inch	Inch	Inch	Inch
7-0	0.490	....	....	....	....
4-0	0.393	0.400	0.460	0.454	0.400
0	0.307	0.305	0.325	0.340	0.324
5	0.207	0.205	0.182	0.220	0.212
8	0.162	0.160	0.128	0.165	0.160
20	0.035	0.035	0.032	0.035	0.036
30	0.014	0.014	0.010	0.012	0.012
40	0.007	0.007	0.003	0.008	0.005
50	....	....	....	0.001	....

As will be seen, the Americans have not yet reached a uniformity of gauges. Every wire mill having arranged its apparatus to to the sizes of its gauge in developing the drawing processes desires to avoid the expense of the change, and therefore it will be a difficult matter to reach an understanding. Besides, the consumers would not very much enjoy a modification of present measures, which are deeply implanted in the usages of the different States.

The greatest proportion of wire drawn, both in America and Europe, is steel, which is easily explained by the comparatively low price of this metal. A little iron is drawn, because, for some uses steel has not yet supplanted it. Thus, for instance, for electrical purposes the iron employed is of a quality equal to the Swedish. In order to show this we transcribe as follows the principal condition of the specifications of the Western Union Telegraph Co.

1. The wire should be soft and flexible and capable of stretching after galvanizing 15 per cent. without rupture.

2. A great resistance is not required. Still the wire should not break under a strain less than two and one-half times its weight per mile. These tests are to be made by direct application of the weight, or by using a simple lever, according to the desire of the inspecting agent.

3. In order to test the ductility a piece of the wire held between two jaws 6 inches apart shall be twisted on itself. The entire number of twists should be distinctly visible between the jaws, and this number should not be less than 15 on the length of 6 inches.

4. The weight per mile should approach as closely as possible the following figures: No. 4, 730 pounds; No. 6, 540 pounds; No. 8, 380 pounds; No. 9, 320 pounds; No. 10, 250 pounds.

5. The electrical resistance of the wire in ohms per mile at 68° F. must not pass the quotient of the constant number 5000 by the weight of the wire in pounds per mile. For instance, the resistance of the wire weighing 730 pounds per mile must not be higher than 5000 divided by 730, equal to 6.85 ohms.

Again, a No. 6 wire must not be above 9.26 ohms; the No 8, 13.16 ohms and No 9 15.625 ohms; the coefficient 0.003 will be allowed for every degree of Fahrenheit in the calculation of the reduction to normal temperature.

6. The wire must be perfectly cylindrical and free from faults, inequalities, cracks or any other flaw. Every bundle must be guaranteed not to contain any weld, joint or splice in the rod before drawing cold. Every wire should be stretched about 2 per cent. before delivery.

7. It is desired that the wire be delivered in bundles in one piece weighing about 150 pounds. If a contractor cannot undertake this he may submit bundles of two pieces only, connected by an ordinary twist and welded with care.

8. The wire must be well galvanized and capable of undergoing the following tests: It must be plunged into a saturated solution of sulphate of copper, where it remains one minute and is then dried. This operation shall be repeated four times. If after the fourth immersion the wire becomes black it is shown that the zinc has not been entirely removed and that the galvanizing is satisfactory. If, on the contrary, the wire assumes the color of copper, it is shown that the iron has been uncovered and that the layer of zinc is too thin.

The thickest wire used for telegraphic purposes in the United States is No. 4, which posesses a conductivity required by the recent multiplex systems of transmission. The Western Union Telegraph Co. are replacing a large number of their No. 6 and No. 8 wires by No. 4. The No. 8 may be considered the average size of all countries. No. 9 and No 10 are consumed in large quantities by the English and American railroad lines, and have short circuits No. 11 or No 12 are particularly used for short circuits, private lines, police-alarm service and fire alarm lines. So far as the telephone wires are concerned, authorities differ on the question of diameter and conductivity. It seems to be admitted that for certain short local lines a tum moderate conducting wire is compatible with the feeble currents of the telephone. Nos. 12 and 14 of soft metal or low-carbon steel may suffice, but the general advice of experts in the question is that No. 12 iron wire is preferable in all respects. The electric resistance is expressed in America and in England by the figure the weight per mile ohm—that is to say, the weight of a mile of wire the resistance of which is 1 ohm only, because of the sufficiently large diameter. In order to know the resistance of any other number of wire it is sufficient to divide this constant figure by the weight per mile of this number, making due allowance for the increase in weight due to galvanizing. It is known that this adds to the surface of the wire a body equivalent in conductivity to almost double that of the iron. A larger conductivity is required in the United States than we use. In reality the police and telegraph lines prescribe for a 4-mm. wire at a temperature 18° Celsus, about 11 ohms per km.—that is, 17.6 per mile, the weight per meter being 105 grams and the weight per mile 375 pounds. The weight per mile ohm is 6600 pounds, while the limit placed decreases for the same temperature to 4900 pounds on the other side of the Atlantic and in England. This figure depends for every metal essential on its purity. Tests made with steel wire have shown that the lowest resistance is found in steels low in carbon, silicon, sulfa and phosphorus. These conclusions are contradicted by those made by Schneider & Co., who hold that low carbon little influences the question, and who neglect entirely sulfa and phosphorus. Whatever the facts may be, the following are our figures:

Total Impurities (C., Mn., P., S. and Si.)	Weight per mile ohm.
0.724 per cent.	12,305 pounds.
0.479 per cent.	10,400 pounds.
0.460 per cent.	9,750 pounds.
0.306 per cent.	8,250 pounds.
0.301 per cent.	6,182 pounds.

The following is the classification of Washburn & Moen, of Worcester, Mass., for wires to be used for electric service:

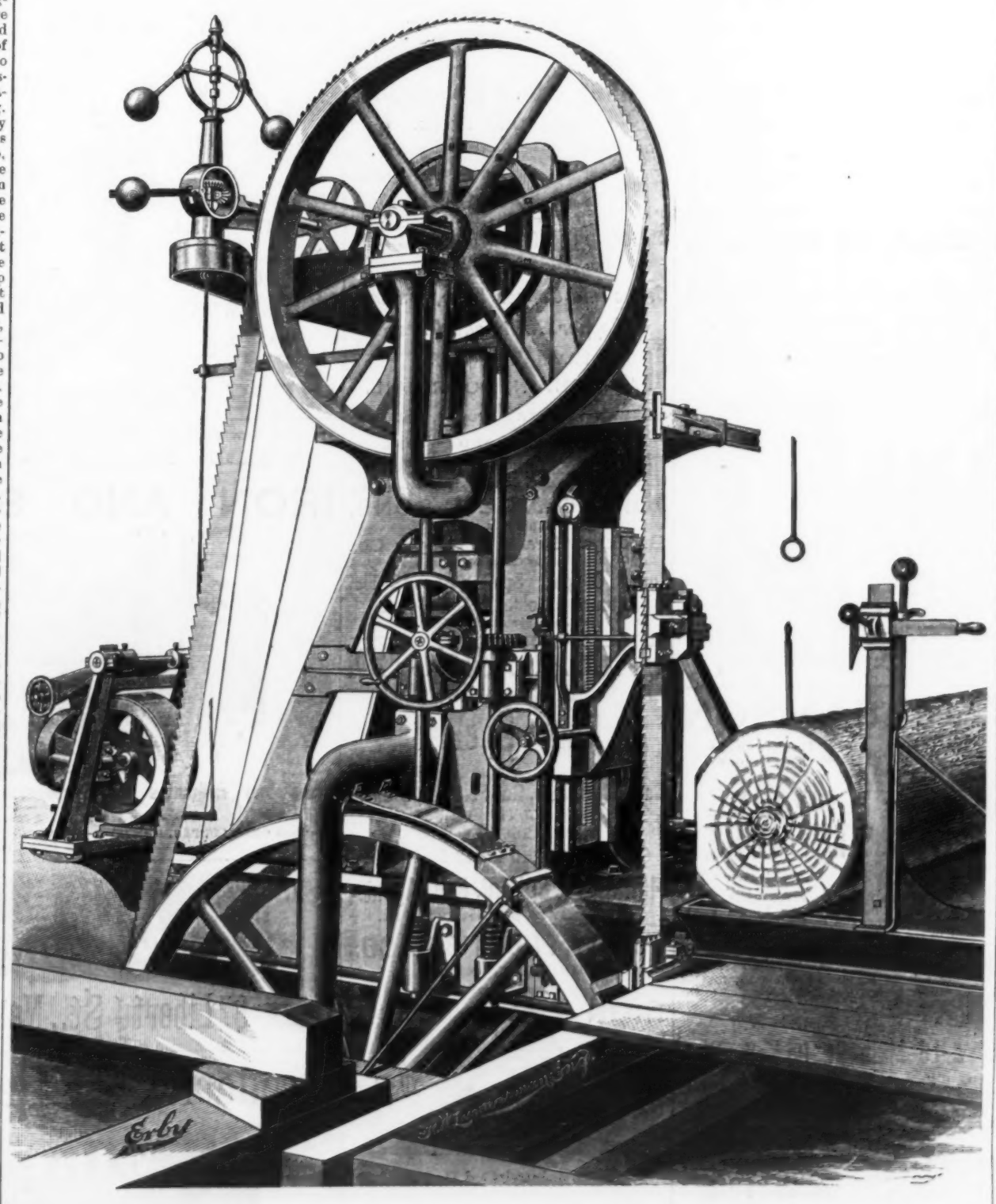
No. 1.—Extra Best Best [EBB], obtained from Swedish charcoal iron. This iron has the highest conductivity. Its weight per mile ohm is 4600 to 5100 pounds; its quality is regular; it is very pure, extremely ductile and flexible. A round bar 20 mm. in diameter shows the limit of elasticity of this metal to be 14 to 14.5. Its tensile strength is 29 to 21 km., with an elongation 20 to 32 per cent., measured on the length of 750 mm., and a contraction of area of 71 to 74 per cent. The galvanized wire will bear 34 to 37 km., with 16 to 19 per cent. elongation on a length of 150 mm., and will regularly undergo 17 twists on the same length, while the telegraph companies are content with 32 kg. tensile strength, 15 per cent. elongation and 15 twists.

No. 2.—The Best Best [BB] is less regular, less soft, but has a greater resistance, 38 kg. The weight per mile ohm is 5500 to 5800 pounds. It is used on a large scale in the telephone service and almost exclusively by some telegraph companies and by some railroad lines.

No. 3.—Best. This form is applied almost without distinction to all inferior qualities of wire for electric service which are hardened and less flexible than those preceding. The weight per mile ohm is about 6500 pounds.

No. 4. The Steel. This is employed to a limited extent for short telephone service where the conductivity is of less importance and where the main point is to have a very light and a very strong wire. The weight per mile ohm is 6600 to 7000 pounds. The same firm also make copper wire. Copper wire, first employed by Morse for the telegraph, was soon replaced by iron wire, because such as was manufactured at that time did not possess sufficient strength for overgrown lines. Modern processes, however, produce a hard copper wire which is very strong and has a high conductivity. No. 14 hardened copper wire will bear 365 to 370 pounds, the joint carrying 335 to 370 pounds. Wire used in practice has a conductivity equivalent at least to 90 per cent. of that of pure copper, and generally varies between 95 and 98 per cent. Its resistance increases with the temperature about 0.21 per cent for each degree of Fahrenheit. Large quantities of this kind of wire are consumed by the telegraph and telephone companies. It is light—in fact, weighs about five times less than the galvanized iron wire per unit of length and the same

(Continued on page 5.)



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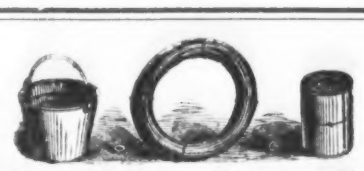

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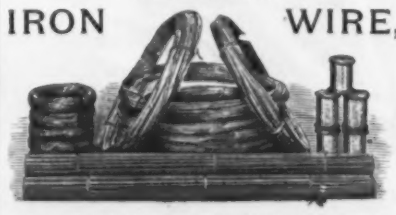

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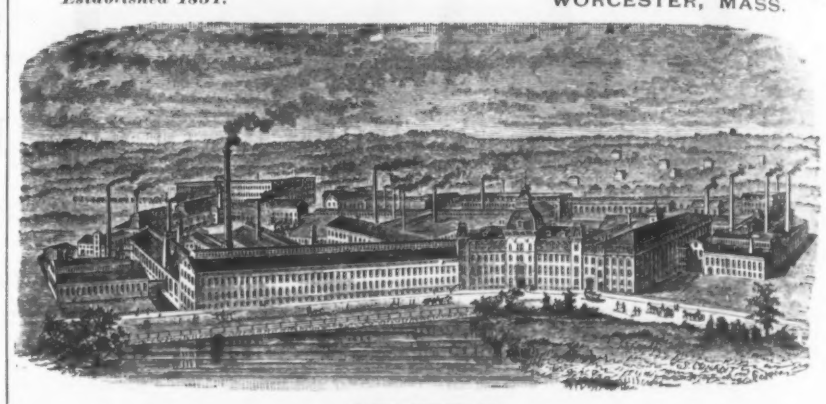

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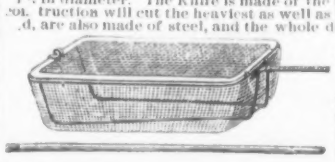

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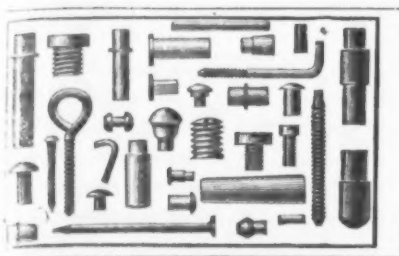

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STUDS, PINS, SCREWS, &c.

For Manufacturers of Light Hardware.

BLAKE & JOHNSON, WATERBURY, CONN.

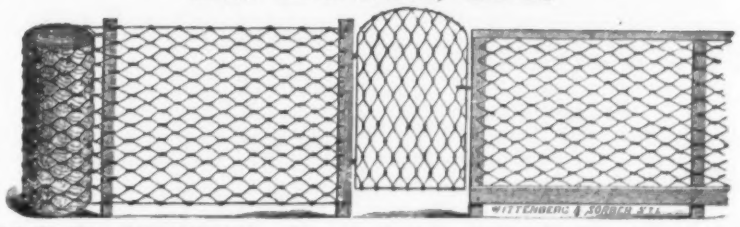
MORGAN SPRING CO.

OIL TEMPERED

WORCESTER, MASS.

LUDLOW-SAYLOR WIRE CO.,

ST. LOUIS, MO.



WIRE, WIRE CLOTH, WIRE ROPE,

Counter Railings, Window Guards, Iron and Wire Fences, Plain and Barbed Fencing Wire.

C. S. Tyler

WIRE WORKS CO

SUCCESSORS TO W. S. TYLER,

MANUFACTURERS OF

BRASS, STEEL AND GALVANIZED WIRE,

FOUNDRY RIDDLES, COKE AND COAL SCREENS.

W. S. TYLER, Pres. E. H. ALLEN, Sec. & Treas

CLEVELAND, OHIO.

TWISTED PLAIN FENCE WIRE.

To meet the wants of those who object to Barbs, the GAUTIER STEEL DEPARTMENT of Cambria Iron Company, Johnstown, Pa., offer the Twisted Plain Wire on Spools, or in bundles of 50 and 100 pounds.

New York Office, 104 READE ST. Chicago Office, 202 First Nat. Bank Building. Philadelphia Office, 523 ARCH ST.

[No. 134.]

NATIONAL WIRE AND IRON CO.,

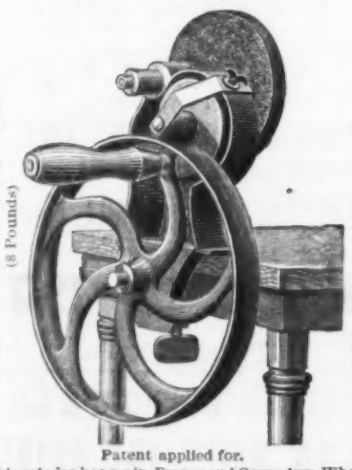
DETROIT, MICH.,

DRAWERS of Fine Brass and Copper Wire.

ALSO WEAVERS OF

BRASS and COPPER CLOTHS.

COOK'S FRICTION (8 Pounds)



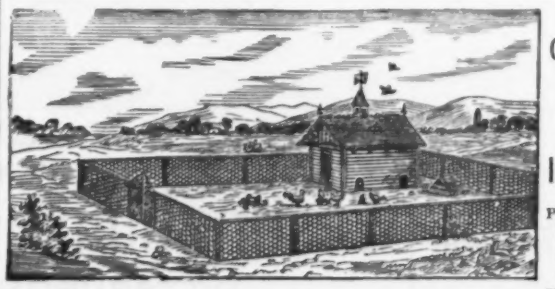
EMERY GRINDER.

Patent applied for.

This grinder has a 5-in. Emery and Corundum Wheel. Runs easily to required speed, viz. 3700; is light, weighing but 8 lbs.; small, occupying but little room; can be used wet or dry; is well made, the frame and wheel of charcoal iron with a hard-rubber friction pulley which can instantly be adjusted to any required tension; spindle, steel, and is just the article for grinding house and shop tools of every description. For prices address

THE K. & W. MFG. CO., Chillicothe, O.

Chicago Office, 209 State Street.



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WAREHOUSES:

42 CLIFF ST., NEW YORK,

228 LAKE ST., CHICAGO, ILLS.,

MANUFACTURERS OF

Iron & Galvanized Wire

Sieves and Wire Cloth.

Power Loom Painted and Galvanized Window Screen Wire Cloth, Galvanized Wire Cloth for Drying Fruits, Warld's Galvanized Web Wire Fence, Galvanized Twist Wire Poultry Netting.

Factories, Georgetown, Conn.

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BARB WIRE LIFTER AND CARRIER.

[PATENTED.]

NO DANGER OF CUTTING HANDS OR TEARING CLOTHES.

SAVES THE PRICE OF THE LIFTER MANY TIMES EVERY DAY.

Manufactured Solely by

Hawkeye Steel Barb Fence Co., Burlington, Iowa.

Our Agents, John H. Graham & Co., 113 Chambers St., carry stock of our Lifters and will supply at Factory prices.

WIRE NAIL MACHINES

(HARDMAN PATENT.)

Five Sizes for Making Nails No. 28 to No. 0 Gauge any Required Length.

Thoroughly tested and in successful operation.

For prices and particulars address

BIRMINGHAM IRON FOUNDRY,

BIRMINGHAM, CONN.

NIEN-TSI CHINESE LACQUER,

Manufactured by ALBERT ASSMAN & SONS.

UNEQUALLED FOR DURABILITY. Prevents Iron, Steel, Brass, Nickel, Copper, Silver, Bronze and all compositions from corroding. *Also resists dampness, KEROSENE OIL and FLY SPECKS.* Can be applied without heating metal.

Sole Agents, H. S. ALLEN & CO., 112 John St., New York.

Would call special attention to manufacturers of Agricultural Implements, Machinery and Architectural Iron Works. Sample and Prices sent on application.

The above cut represents Preston's Patent Braided Cable Wire Fence Rail, manufactured by the **HOLLOW CABLE MFG. CO., Hornellsville, N. Y.** We also manufacture extensively four different sizes Wire Clothes Lines. Send for Circulars and Price Lists.

C. S. CHAMBERLAIN, 55 Dearborn St., Chicago, Ill.

PATENT OFFICE,

Roeder & Briesen,

82 and 84 Nassau St.,

NEW YORK.

American and Foreign

PATENTS

Solicited promptly and at the lowest rates.

GEO. B. TURRELL, Pres., 75 Chambers St., New York. DUNCAN K. MAJOR, Treas., Torrington, Conn.

UNION HARDWARE COMPANY,

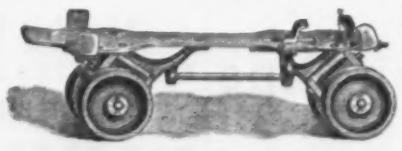
ESTABLISHED 1864. Torrington, Conn., U. S. A.

HIS CUT ILLUSTRATES OUR LATEST STYLE

CLUB SKATES

For Rink and Private Use,

BOTH FOR LADIES AND GENTLEMEN



The advantage being that they will fit any style of heel, whether large or small, without the use of straps.

82, Frosted Nickeled, Per Pair, $5.50.

83, Polished Nickeled, Per Pair, $6.50.

Manufacturers of Ice and Roller Skates and Specialties in Hardware. Wood Turners, and Electro-platers in Gold, Silver, Nickel and Brass.

ESTIMATES FURNISHED FOR WOOD TURNING AND PLATING ON APPLICATION.

THE BILLINGS & SPENCER CO.

HARTFORD CONN.

MANUFACTURERS OF SCREW PLATES AND

DIES MADE IN 5 SIZES CUTTING

THREADS FROM 1/16 OF AN INCH

TO 2 INCHES V THREAD. ALSO

U.S. STANDARD AND WHITWORTH THREAD

DROP FORGED OF BAR STEEL.

"FLORENCE" LAMP STOVE.

PRICE, $1.50

Weight 4¾ lbs. No glass to break. Will boil a quart of water quicker than kindling can be found to generate a fire in a range. Sent to any address in the U. S., express paid, on receipt of $1.50.

Pat. Nov. 14, 1876, & July 11, 1882.

WHAT!

that little

FLORENCE

HEATING STOVE

HEAT A ROOM?

CERTAINLY,

thousands have done so.

Send for circulars, etc. to

FLORENCE MACHINE CO.,

FLORENCE, MASS.

Sample Lamp Stove gratis to responsible dealers upon application.

LANE'S PATENT STEEL DOOR HANGER.

The most perfect Anti-Friction Hanger in the Market,

BECAUSE

It is made of steel throughout, except the wheel which has a steel axle. It will not break. It is practically free from wear. It is almost noiseless in action. It requires no oil. It has a broad bearing on the door, and keeps in line. It is by far the most durable. It may be used with any track. It is always in order.

LANE'S PATENT TRACK

Is made of steel and is easily put in position. Catches and holds no snow or ice. Door hung thereon cannot jump the track. Is not subject to decay. Requires no fitting, but is ready at once. May be used with hangers of other manufacture.

Manufactured by LANE BROS., Poughkeepsie, N. Y.

JOHN H. GRAHAM & CO., General Agents, 113 Chambers Street, NEW YORK.

WICKWIRE BROTHERS, CORTLAND, N. Y.,

MANUFACTURERS OF

WIRE CLOTH AND WIRE GOODS

"CORTLAND"

WINDOW SCREEN

WIRE CLOTH.

Metallic Coal Sieve.

Dish Covers, Corn Poppers, Coal Sieves, Flour Sieves, Etc., Etc.

DIEBEL MANUFACTURING CO.

N. E. Cor. 3d and Cumberland Sts., PHILADELPHIA, PA.,

MANUFACTURERS OF THE

CHALLENGE EMERY GRINDERS, POLISHING MACHINES, COUNTER SHAFTS, HANGERS, &c.

Contractors and Builders of Light Machinery and Hardware Specialties.

(*Continued from page* 1.)

conductivity. On the other hand, experience has shown that the density of the copper wire diminishes by the passage through it of the electrical current, while that of iron wire increases under the same circumstances. For electric-light lines, where all the wires are carefully isolated and protected, a No. 4 Brown & Sharpe wire is often used, although No. 6 is more popular for arc lights. For incandescent lights all dimensions are used, starting from No. 20 Birmingham wire gauge. There are also made in the United States phosphor-bronze wire No. 6 and No. 14, being employed particularly for telegraph, and No. 16 and No. 18 for telephone lines. They resist well the corrugation of acid fumes of moisture, the sea air and the air in mines. They carry about four times their weight per mile, have an electric resistance of only one-half of that of iron wire of the weight, but 2½ times that of hardened hard-drawn copper wire. They are used for light lines of long spans and are hardly visible when suspended at a certain hight. The following are the relative points of the phosphor-bronze wire made in Philadelphia:

Stubbs' gauge.	Weight per mile. Pounds.	Resistance per mile. Ohms.
No. 6	658	5.4
No. 8	435	8.3
No. 14	110	33.0
No. 20	20	190.0

(To be continued.)

English Letter.

(*From Our Regular Correspondent.*)

London, November 2, 1885.

THE PENULTIMATE MONTH

of 1885 has now commenced, and we are thereby brought within what may be termed "measurable distance" of the end of the year. Almost, or quite, all the arrangements for the quarter have been made, and, as the quarter really means the balance of the year, it follows that the tale of the twelve-month will speedily be told. There will be buying and selling, of course, all the time, but it will be in respect of surplusage or buying on behalf of such consumers as have felt strong enough to take their chances in the open market when they require fresh supplies. The bulk of the work of the year, however, has been decided, and will be worked out on settled and well-defined lines; hence there is little or no reason for supposing that we shall have any upward range in values during this and next month. On the other hand, a slight, and it may be persistent, reduction in prices may set in, as the natural outcome of a state of things in which sellers are more numerous and more importunate than buyers. Whatever may come about will be more or less tentative until the middle or third week of December, by which time the outlook for the new year will be more clearly discernible. The general position of affairs will be more settled by then, and the yearly statistics will begin to have the weight due to their approximate completeness. Until the period indicated, therefore, we seem pretty certain to go on very much in our present style. An improvement may make itself felt in the meantime, but such a change is not at all probable, especially when due allowance is made for the general election excitement and waste of time. For several years past the end of the year has been characterized by much dullness, and all appearances seem to indicate that the closing weeks of 1885 will be worse rather than better than those of its immediate predecessors. Statistics are all "going wrong" together and it is now too late for them to be sufficiently improved to present even a moderately satisfactory showing when compared with those of the past few years. There is a general impression—which is probably a correct one—that we shall manage to find a fair amount of employment for the remainder of this year, but that 1886 will be commenced under very indifferent conditions. Our "return" will be examined and found wanting, and we shall be greatly discouraged at the very threshold of the new era in the world's history. Let us hope, therefore, for an early amendment. As a preparation for what is coming, the ironmasters of the North of England (Cleveland) district have given notice to their men that they cannot possibly maintain the present rates of wages, which they propose to revise as soon as possible in a downward direction. The men have not yet decided what they will do, but when the time arrives their acceptance of the reduction appears probable and reasonable. The arbitration conducted with regard to the wages of the North of England puddlers, mill and forge men has been terminated by the award by the arbitrator of a reduction of 2½ % on mill and forge pay, and of 3 % ₰ ton on puddling. This is less than was demanded by the employers, while the men objected to make any concession whatever. While speaking of the North of England I may mention that there are reports in circulation thereabouts stating that orders are being received from the United States for pig iron. Quantities of 500 tons "in a line" are alluded to, but I have no reliable details at present either as to buyers or vendors. It is alleged that ordinary pig iron of Cleveland, G.M.B., is in question, otherwise I should have supposed that either hematites or spiegeleisen had been the subject of the negotiations. I may know more of the matter before my next letter.

ENGLISH CHARCOAL PIG IRON.

In connection with the controversy which has sprung up here over the sending of American charcoal pig iron to England a letter is published which contains sundry particulars of interest to your readers. This letter runs as follows:

To the Editor of The Ironmonger.—Sir: In the leader in your issue of the 10th inst. concerning American charcoal pig iron there is one view expressed, to wit: "Should any considerable demand for charcoal pig iron arise * * * it could not be met at home * * * simply because we possess no charcoal supply for the purpose," which, I think, is subject to some slight correction. In consequence of the very extensive substi-

tution of steel for charcoal-refined bar iron in the manufacture of tin plates during the last few years, the consumption of charcoal by our tin-plate makers has fallen off immensely, and, as a further consequence, charcoal is now regarded by the numerous wood distillers of South Wales and the Forest of Dean as being more in the nature of a by-product than a leading article, as formerly. In the case of some distilleries not well placed for railway communication to more distant markets the difficulty in disposing of their charcoal has led to their stoppage, and the bulk of the coppice-wood, top and top, &c., formerly devoted to cordwood for charcoal, is now converted to other purposes, with a concurrent decline in value. Between the eastern limit of Dean Forest and the western limit of Carmarthenshire there would be no difficulty in getting year by year henceforward enough of charcoal to make at least 100 tons of pig iron per week. This would employ, say, three furnaces, and since in the case of charcoal, owing to its bulkiness and friability, it is better to take the ore to the fuel than *vice versa*, it would perhaps be necessary for making the foregoing charcoal available to erect one charcoal blast furnace in the Forest of Dean, one in Carmarthenshire and another in either Monmouthshire or Glamorgan. I have read in your issue of 24th inst. the letter from the manufacturers of the Lorn charcoal pig iron made in this country. Theirs is an old-established firm, and their produce has from the first enjoyed, as it continues to enjoy, a well-deserved high reputation. They go upon the principle of never deviating a hair's-breadth from the smelting practice which at first established their reputation—the same mixture of red hematite ores plus some argillaceous, the same description and proportion of fluxing material, the same (in the eyes of Swedes and Americans extravagant) proportion of charcoal, the same cold blast, the same small weekly make of pig iron per furnace, and, by consequence from all this, the same high quality of pig iron.

Some of their produce, I understand, is used by crucible-steel melters as well as for more general purposes, but the bulk of it is said to be devoted to malleable castings, for which purpose it is much appreciated in France, among other parts of the world. That it is deserving of its reputation the following published analyses will show—the makers of the iron having had nothing to do in this case with either the selection of the samples or conduct of the analyses:

	Lorn Pig Iron. White. Per cent.	Mottled. Per cent.	Gray. Per cent.
Carbon, graphitic	...	1.82	2.54
Carbon, combined	3.43	1.50	1.55
Silicon	0.19	0.53	1.14
Phosphorus	0.065	0.07	0.05
Sulphur	0.04	0.04	0.05
Copper	...	0.014	....
Manganese	0.099	0.05	0.06

Can any practice be adduced that will beat the above? Not, I think, in Sweden, Styria or the United States. The white pig iron (for which, I understand, there is most demand for the malleable-castings makers) is marvelously pure, and were it produced with a little less carbon would be the ideal pig for malleable castings. The other descriptions are equally superior for the purposes they are suited to. The interest I take in the matter arises from the fact that these unexcelled and probably unequaled pig irons are wholly and solely of British origin. Were wrought iron produced from Lorn white pig by charcoal refining in the same manner as Baron de Geer's celebrated "hoop L" bars are from Dannemora pig, who can doubt but that a bar-iron product equally as good would be obtained? As it is, the composition of the white pig (eliminating carbon, of course), even before the supposed refining, compares very favorably with the published analyses of hoop L-bars.

Before closing I would like to say that the blast-furnace slag accompanying white Lorn pig-iron smelting is, like the pig itself, a little out of the usual run. The slag is even more acid than generally accompanies white iron, and, as a result to be expected therefrom, contains an appreciable quantity of iron protoxide. Another feature is that the oxygen in the protoxide bases only very slightly exceeds that in the sesquioxide base. Counting these, however, as being equal, then the proportions of oxygen in the three members of the slag are nearly as follows: In the silica, 4; in the alumina, 1, and in the protoxides 1. These proportions will possibly be matter of interest to those practical iron smelters among your readers who may not be familiar with them, and will also furnish an idea of the composition of the furnace burden. I have only to add, by way of showing, in conjunction with the pig analysis, the necessarily exceptional purity of the raw materials used, that the slag is free from both sulphur and phosphorus. Considering the nature of the slag, we might, of course, expect all the sulphur to be found in the pig iron, but all the phosphorus is to be found in it also.

Yours truly, THOMAS MORGANS.
THE GUILDHALL, BRISTOL, October 27.

THE METAL MARKET

is again without special change to note on the week, and it begins to look as though the remainder of the year would be characterized by marked quietude. The shipping season for the Northern ports is about at an end. Ice having already formed in the North of Russia and in other quarters, the navigation cannot be expected to remain open much longer. At Glasgow there has been a quiet market for warrants, which closed at 41/2½ ₱ ton. Makers' brands of Scotch pig are in poor request, and values are rather easier, while the reserve stocks are still being largely augmented. Scotch shipments of pig iron are small, but the consumption in Scotland of Cleveland pig iron is on a much larger scale than last year. At Middlesboro' the market is lifeless, and prices are based upon about 32/1 for No. 3 foundry. The shipments are not up to the mark, and may be expected to fall off for the winter, while the local consumption is bad. On the West Coast there is only a very sluggish demand for hematite pigs, which are called about 42/6 ₱ ton for mixed numbers in ordinary proportions. Stocks are increasing and the shipping branch is quiet. Elsewhere all grades of crude iron are dull, and sales in the open market are on favorable terms for buyers. In spiegeleisen and ferromanganese a limited turnover is taking place, although some lots of 20 % spiegel are going to the United States. Heavy manufactured iron is being produced on a fairly good scale, and there is a steady call for bridge and other structural-iron work. Fencing wire is very dull and irregular in values. Galvanized sheets are in large production, but values are not quite so uniform as they were a short time ago. Ordinary finished iron is somewhat irregular and it is not easy to give definite quotations, but a fair quality of bar is to be had at about £5. 10/ ₱ ton, with common down to £4. 17/6. The sheet mills are mostly well employed, and those manufacturers are firm in their views. Generally speaking, the demand for rolled iron runs on common and medium sorts. Old materials are steady, but not much altered in prices. Freights are as of late, Glasgow rates being nominally easier at about 1/6 ₱ ton for pig iron by ordinary steamers to New York. The cutting of Australian freights continues. Steel is quiet in all directions, especially in respect of crucible cast sorts. Bessemer rolled is in request, and a large tonnage weekly is being used up for a great variety of purposes. The Siemens works are all well engaged. It is now stated that the order for steel sleepers given by the Midland Railway Co. to the John Cockerill Co., Seraing, Belgium, was simply for experimental purposes, and only covered about 250 tons. Steel rails are unaltered at late figures and in all other respects. It is rumored that the Victorian Government order for 40,000 tons or thereabouts has gone to Germany. It is also rumored that there is dissension in the international combination of steel rail manufacturers, the alleged cause of discontent being the Indian orders which the German makers are not allowed to take, as being home orders reserved to the British mills.

AMERICAN LOCOMOTIVES.

I notice in your contemporary, the *Ironmonger* of October 31, an editorial note calling upon the British locomotive builders to vindicate themselves from certain charges leveled against them by Mr. E. Richardson, Minister of Public Works in New Zealand. These charges are contained in the following paragraph:

"Before leaving this subject it may be desirable that I should refer here to a transaction which has recently taken place with regard to some 20 locomotives which were ordered from England in July and November, 1883, to be delivered for shipment between June and March, 1885. In October last I received a cable message from the agent-general to the effect that two of these engines were shipped, and that they were so heavy that it would be necessary to strengthen all bridges on the lines they were to run upon. On inquiring as to how this could be, I found the engines with tenders, as constructed, were 10 tons heavier than they were specified to be. I immediately refused to take these engines, and, after a very long and expensive correspondence by cable and letter, the contractor, finding that we would not take the engines as built, agreed to alter them in a manner satisfactory to the department at their own cost. These engines as altered are now coming forward. In the meantime, being disappointed in not receiving engines at the time when they were expected, I was obliged to order others, and succeeded in making a contract with the celebrated Baldwin Co., of Philadelphia, to supply 12 engines on the same specifications as those sent to England in 1883. The order left New Zealand on December 6, 1884, and we have had advices of the shipment of the whole number at New York by May 1, 1885—namely, five months from the time of the order leaving here. And a still more satisfactory part of the business is that they will be fully £400 per engine less than the English ones. As it is evident from our experience in the case of these locomotives, and also from the case of defective axles, which I have already referred to, that the system of inspecting at present in force in England is far from satisfactory, it has been determined by the Government to inaugurate a better system for the future." If these facts are as stated, they certainly afford excellent testimony to American promptitude, skill and economy.

SCOTCH PIG IRON

has been very quiet since my last report, and has undergone a reduction in values, both as regards warrants and makers' special brands. The statistical position is highly unfavorable and does not promise to be better this year. There are now 91 furnaces at work in Scotland, as against 95 a year ago. In Connal's stores the quantity is 632,265 tons (an increase of 1012 tons last week), compared with 580,537 tons this date 1884. Shipments to date are 87,792 tons behind, while the imports of Middlesboro' pig iron are 97,937 tons ahead of those of last year. Current prices are:

Deliverable alongside.	No. 1	No. 3
Gartsherrie, at Glasgow	46/	42/
Coltness, "	48/6	45/6
Langloan, "	47/6	45/
Summerlee, "	47/6	43/6
Calder, "	51/6	48/6
Carnbroe, "	45/6	43/
Clyde, "	45/9	41/9
Monkland, "	42/	40/
Quarter, "	41/6	39/6
Govan, at Broomielaw	42/	40/
Shotts, at Leith	47/	46/6
Carron, at Grangemouth	51/	47/
Kinneil, at Bo'ness	46/6	43/
Glengarnock, at Ardrossan	45/6	42/
Eglinton, "	41/9	38/9
Dalmellington, "	43/	40/

MIDDLESBORO' PIG IRON

otherwise frequently termed Cleveland pig iron, continues extremely dull, and there is considerable difficulty in defining bottom prices. The smelters are largely undersold by merchants and other second holders, and average rates to-day for G.M.B., f.o.b. at makers' wharves, in the Tees, for cash, less 2½ % 10th of following month, are:

No 1 Foundry	34/6	Mottled	30/9
" 2 "	33/6	White	30/3
" 3 "	32/	Refined metal	50/
" 4 "	31/6	Kentledge	35/6
" 4 Forge	31/	Cinder	30/

TIN PLATES.

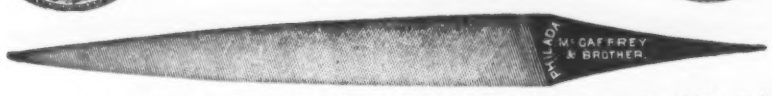
In London there is very little to report anent the course of this market, for quotations remain without change, and makers, as a rule, are outwardly just as firm as they were for full prices, while the large buyers are equally strong in their intention to re-

Paris, 1878. *For Superiority.*

McCAFFREY & BRO.,

PENNSYLVANIA FILE WORKS,

Philadelphia, Pa., U. S.



Manufacture and keep in stock a full line of *FILES* and *RASPS* only, for which we claim special advantages over the ordinary goods, and ask domestic and foreign buyers to allow us to compete for their trade.

Superiority acknowledged wherever used, sold or exhibited.

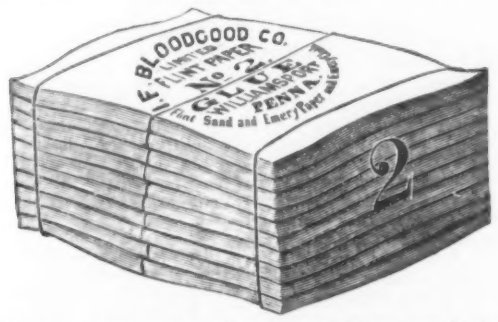
I. F. BLOODGOOD COMPANY, Limited,

WILLIAMSPORT, PA.,

MANUFACTURERS OF

Flint, Garnet and Emery Papers,

Emery and Crocus Cloths.



We strictly guarantee our quality as equal to any make in market.

FOR SALE BY OUR AGENTS,

JOHN H. GRAHAM & CO.,

113 Chambers Street, NEW YORK,

AT LOWEST FACTORY PRICES.

LIGHTNING HAY KNIVES. WEYMOUTH'S PATENT.

This knife is the best in use for cutting down hay and straw in mow and stack, cutting fine feed from bale, cutting corn stalks for feed, cutting peat and ditching marshes.

The blade is best cast steel, spring temper, easily sharpened, and giving *universal* satisfaction. A few moments' trial will show its merits, and parties once using it are unwilling to do without it. Its sales are fast increasing for export as well as home trade, and it *seems destined* to take the place of all other Hay Knives.

They are nicely packed in boxes, one dozen each of 50 pounds weight, suitable for shipping by land or water to any part of the world.

MANUFACTURED ONLY BY

HIRAM HOLT & CO., East Wilton, Franklin Co., Maine.

For sale by the Hardware trade generally.

CAUTION:

We are informed that various parties are infringing upon the widely known Letters Patent granted originally to George F. Weymouth, for an improved Hay knife.

The characteristic feature of the invention is a curved blade, provided with saw-tooth cutters, and furnished with suitable working handles. It is our purpose to prosecute all infringers of our patent, and we have already commenced one suit, which is nearly ready for hearing, and are about commencing suits against other parties.

All manufacturers are hereby warned of our rights, and the public are cautioned against purchasing any Hay "Saw Knives" which are not of our genuine manufacture

HIRAM HOLT & CO.

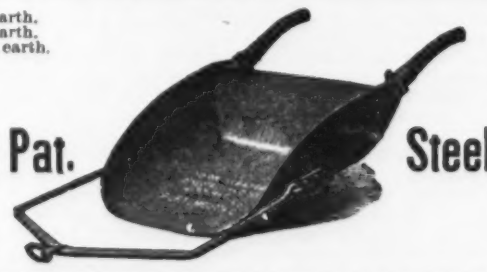
EAST WILTON, May 26, 1884.

No. 1 Carries 7 feet earth.
No. 2 Carries 5 feet earth.
No. 3 Carries 3½ feet earth.

PATENTED December 27th, 1881.

Runners Patented February 11th, 1884.

The York Pat. Steel Scraper.



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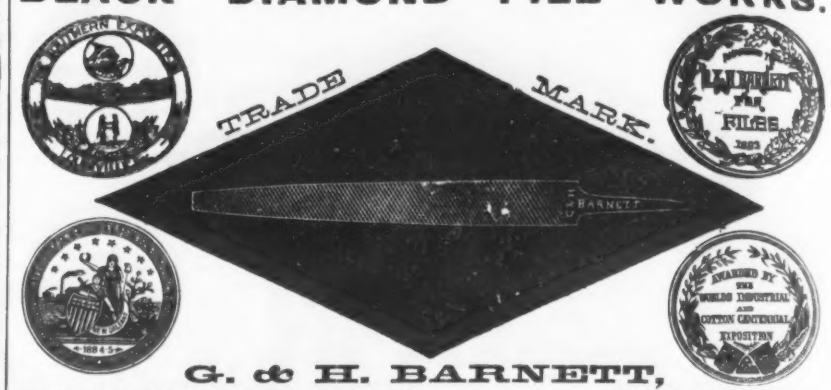

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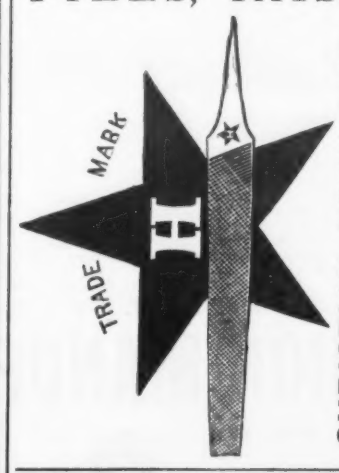

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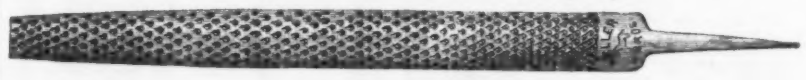

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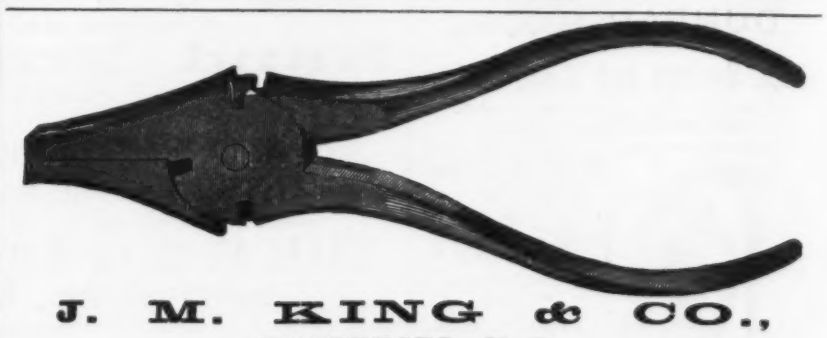

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main quiet until orders can be placed to better advantage than at present. Most of the works, however, are reported to be well off for work, though it is believed a good proportion of firms have worked off a considerable part of the orders on their books. I quote ordinary brands of IC cokes 14/6 @ 18/ f.o.b., Liverpool. At Liverpool there seems to be a lull in the tin-plate business. Several things have contributed toward this. In the first place buyers got scared at the numerous lots of coke tins, chiefly of 14 x 20 size, with some IC 12 x 10, that were offered to them from various quarters, and in addition to this very many works set about clearing out all their old stock of odds and ends. This, coupled with the fact that the demand from the States had somewhat fallen off, caused buyers to hold off altogether for a while, in order to see how things would ultimately settle down. The number of ordinary size coke tins and steels offering by second-hand dealers, as well as in some cases by makers, is astonishing, and completely took buyers by surprise. In that respect the market is quieter, and prices undoubtedly are easier, though this applies to the American demand and for ordinary sizes especially. Yet there are a few orders for odd sizes still coming forward, and in addition to this there is a good Continental demand. For these 14/6 IC for coke tins and 15/3 IC for Bessemer steel plates have been paid for both markets, but for ordinary kinds of coke tins in the numerous brands that are offering 14/ @ 14/6 is the utmost that can be had, though it must be admitted that these figures are not taken as yet. Most sellers are standing out for 14/ @ 15/ IC. There is but little demand for charcoal tins and ternes. Coke-tin wasters are now to be had at 13/6- There has been a fair demand for Siemens steel plates with coke finish, and 15/6 IC for assorted specifications is about the figure.

THE HARDWARE TRADES.

In London the home trade continues to show a steady improvement in many branches, although the keenness of competition prevents anything but a very small profit on the orders booked. The business after all, is only of a hand-to-mouth character, but the general tone of traders is far more cheerful than at the close of last quarter. At Birmingham the home trade in most branches is reported to be quietly progressive, though prices still rule very low. The only upward movement at present is in tin plates and whalebone, the rising tendency of the former contributing to stiffen the prices of all descriptions of tin plates, and especially stamped goods, while the rise in whalebone, which amounts to about 50 %, is seriously embarrassing the whip-makers, and especially those who are under contracts based on the old price of the material. In both cases, however, the rise is accompanied by a certain revival of demand, many of the orders being evidently placed in anticipation that the upward movement will continue. Government continues to be a good customer for war materials, including saddlery and knapsacks, military rifles and solid-drawn cartridges, for which latter an extensive order has fallen to Kynoch & Co., Limited, who estimate that in wages alone it must represent from £30,000 to £40,000. At Sheffield, despite the gradual opening out of the season trade, there is a general consensus of testimony to the effect that the volume of business (to say nothing of prices) falls short of what it was the same period last year, which in turn fell short of the orders of the year preceding that. Few of the manufacturers in any department are able to report themselves really busy. Orders are numerous enough as a rule, but they are much deficient in weight, the result being that, while there is almost as much labor involved in executing these small lines as in larger ones, the return in cash is proportionately small. The export trade remains without variation, and the prolonged impoverishment of foreign and colonial orders is keenly felt by the great majority of the leading houses. Some trifling improvement, propably due to special causes, is traceable in Canadian lines, but the American mails are destitute of any substantial sign of revival. Australia and New Zealand are buying sparingly, and very little business in finished goods is being done with the Eastern markets. The Balkan difficulty has thrown its shadow across the general trade of the Continent, but the main unsatisfactory feature about the current orders from the German States and Scandinavia is their exceeding smallness. At Wolverhampton the best news in the iron trade this week is the restarting of the Osier Bed Iron Works by Messrs. Lysaght, Limited. These works will be run by the firm in addition to their present Swan Garden Works, which are in full operation. Galvanizers, as well as black-sheet makers, keep busy, and a report is current that one large firm has consented to send to Australia 1000 tons monthly to the order of one importing house alone. The advance in the prices of tin plates is beginning to tell upon the prices of hardwares. The Anglo-American Tin Stamping Co., Stourport, have issue circulars announcing a reduction in discounts upon tinned hollow-wares of 5 %. Large orders for builders' ironmongery are being secured from some of the Scotch wholesale houses.

Mr. William P. Shinn has contributed to the "Transactions" of the American Socie'y of Civil Engineers a valuable paper on power brakes for freight trains, in which he gives the details of tests with the buffer brake made by the American Brake Co., St. Louis, Mo. Mr. Shinn, in conclusion, says: "My experiments with the American brake, on the gradient of 528 feet per mile, descending, show that by its use a train of 400 tons, running 25 miles per hour, can be stopped in 41 seconds in running 839 feet, while with three brakemen setting hand-brakes it took 95 seconds and 2322 feet. With a long and heavy train the disparity would be still greater. The evidence shows that a good buffer brake is a valuable addition to the driver-brake for stopping freight trains, and that the American brake is cheap in cost, economical in its maintenance and reasonably efficient in its action. By its use many times its annual cost will be saved to the companies adopting it, and many lives will be saved every year. I fully believe that the saving in current expenses, by dispensing with brakemen, avoiding flattening of wheels, time saved in switching and handling trains at stations and sidings, &c., will more than pay its annual cost, leaving the saving in expense of accidents and wrecks as entirely a profit by its use."

Hand Grenades as Fire Extinguishers.

The much-discussed hand-grenade has again been made the subject of an article in one of our contemporaries. *The Sanitary News* has recently received a report from the Agricultural College of Lansing, Mich., on the character and value of hand-grenades. The trouble of an investigation having been undertaken, it is to be regretted that it was not conducted in a more exact manner, and quantitative, together with qualitative, analyses made instead of only the latter. As it is, however, the results are of considerable interest as showing the simple ingredients which compose the fire-extinguishing solution. A qualitative analysis of the contents of a Harden hand-grenade, the report stated, showed the liquid to contain in solution common salt, sulphate of lime and a small amount of acetate of soda, the principal ingredient being common salt. It is very certain that the proportion of sulphate of lime is exceedingly small, from the fact that this salt is nearly insoluble in neutral and slightly acid solutions. The quantity of acetate of soda is given as small. The entire virtue of the hand-grenades, therefore, seems to lie in the brine which they contain. The fire-extinguishing properties of common salt are well known, and the salt-bag is often in requisition in country houses when the chimneys catch afire. The same extinguishing effect results when a hand-grenade is broken in a fire and the saline solution is scattered over the flames. The contents of the Lewis hand fire extinguisher was also analyzed, and found to consist of sulphite of soda in weak caustic ammonia. Trusting to the correctness of this published analysis, it will be seen that the fire-extinguishing power of the Lewis grenade is due to the sulphurous acid gas evolved when the solution is heated. Neither of these extinguishers would seem to give very much better results than an equal quantity of a solution of common salt contained in a glass bottle and thrown on a fire under similar conditions.

Some time ago Professor Ador, of the University of Geneva, analyzed the contents of an American hand-grenade, and found that the fluid, evaporated to dryness, left one-third of solid substance consisting of 10 per cent. of sal ammoniac and 25 per cent. of table salt. These two results obtained from entirely different sources agree in the essential particular, namely, that the fire-extinguishing power of such solutions is due to the presence of chloride of sodium or common salt. Carbonic-acid gas, which is so efficient in putting out fire, was not found in appreciable quantities in any of these solutions, and, in fact, the analyses showed the entire absence of any base or acid from which this gas could be generated. The facts of the case being what they are, the domestic manufacture of hand-grenades will probably soon become a thriving industry, and it is possible that the companies controlling the patented hand grenades may find each of their customers a rival manufacturer competing for his own trade. We do not wish our remarks to be construed into a condemnation of the hand-grenade, for it is undoubtedly a very useful article in a certain class of incipient fires. Brine has decidedly greater fire-extinguishing power than ordinary water, and when put up in colored glass bottles or flasks is not so unpleasantly suggestive as the ordinary row of fire-buckets.

Iron Substructure for Railroad Bridges.

Recently a number of invited guests examined a number of iron bridges on the Cleveland and Marietta Railroad, the substructure of which was put up by the Iron Substructure Co., of Columbus, Ohio. The *Railway Review* has printed an illustrated description, from which we gather the following:

The method of construction consists in the use of cast-iron piles as a substitute for masonry, under the Gray-Abbott patent. This pile is an iron cylinder with four radiating flanges. The lower end of the pile is solid and pointed. The lower ends of the flanges are also beveled and sharpened, extending to the point of the pile. The upper end of the pile is a cylindrical socket, and over this there is fitted a cap, the upper portion of which is a flat plate with flanged edges for receiving the bridge beams. The form of the pile is such as to afford the greatest strength with a minimum of metal, and at the same time make it easy to drive. It can be driven through any kind of soil and even into sandstone, shale, &c., without breaking. In driving, a solid cylindrical piece of wood is fitted into the socket of the pile to receive the blows, and is removed when the pile is driven. In case great length of pile is needed, a very simple and secure system of splicing is adopted. In order to increase the bearing, plates are sometimes used a short distance beneath the surface. These have, however, been found unnecessary, and will not generally be employed, as the pile has sufficient bearing and is stiff enough without them.

The Cleveland and Marietta Railroad runs along Wills Creek and crosses it 18 times in 25 miles. The stream is sluggish, and at certain seasons brings down immense quantities of driftwood, which is prone to lodge against any obstruction and accumulate in an unpleasant manner. The bridge just above Byesville was built on wooden piles which obstructed the stream and was a constant source of trouble and expense. It being necessary to rebuild it this year the receiver of the road determined to avoid future trouble by using iron piles, leaving the channel of the stream entirely unobstructed and offering less chance than masonry for lodgment of driftwood at the shore ends. The bridge has been recently completed. It is 124 feet span, 14 feet roadway and 19 feet clear hight. The iron piles

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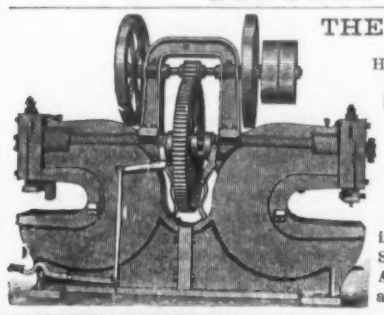

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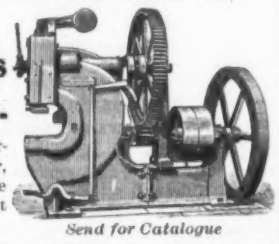

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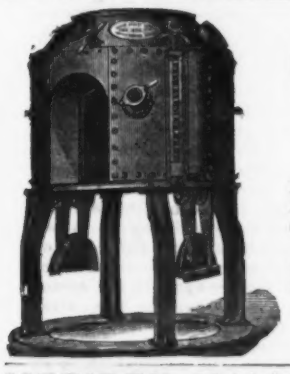

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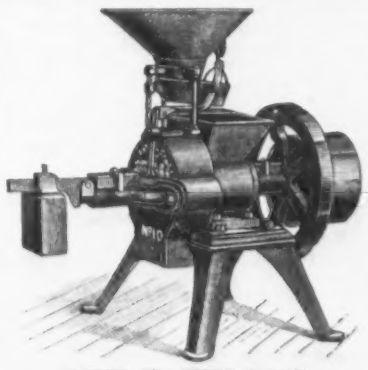

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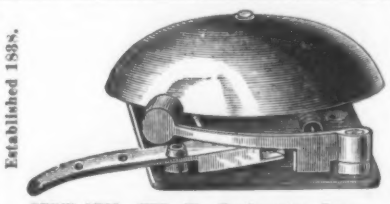

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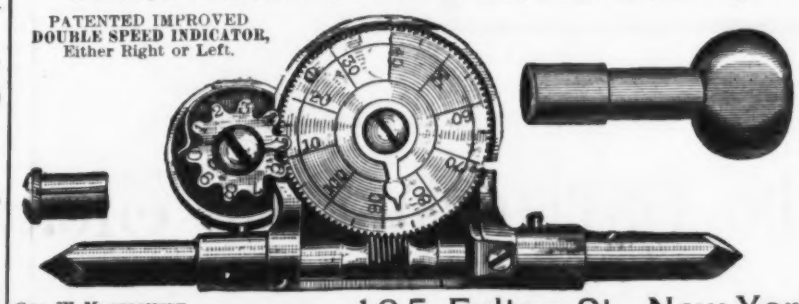

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The weight of the Swing is a little less than 100 pounds It is very strong, having been tested by four men whose weight aggregated over 800 pounds.

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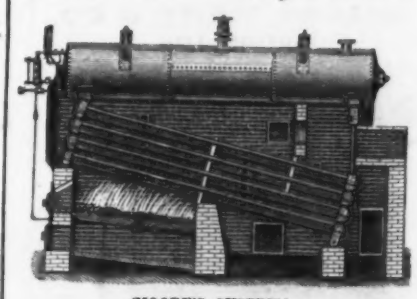

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are 33 feet long, were driven by a 1900-pound steam hammer through 6 feet of clay and 18 feet of soft muck, and rest upon solid shale rock 38 feet below the rails. The cost was about one-half that of first-class masonry, which to all intents and purposes it equals. The piles were very rigid and the vibration under the passing of heavy trains at rapid speed was very slight. The superstructure of this bridge is a wooden Howe truss of noticeable superiority of material and workmanship. It was furnished by the Smith Bridge Co., of Toledo, Ohio.

SCIENTIFIC AND TECHNICAL.

Telephoning from Lightships.

An experiment of great importance is now being made on the East Coast of England by the Telegraph Construction and Maintenance Co. For the last eight months several of the company's best operatives have been located in the neighborhood of the Naze, off which are the most dangerous sands round England. They are hourly in communication by telephone with a lightship which is anchored 10 miles out in the vicinity of the Swin passage. An ordinary telegraph cable has been laid to the lightship, and telephonic and telegraphic apparatus have been affixed to both ends. It was considered improbable that the human voice would be conducted 10 miles, especially in rough weather; but this has been now proved by these experiments to be thoroughly practicable. The signaling of vessels passing the lightships would be of commercial value, as everything could be made ready beforehand for the landing and sale of the cargo.

A New System of Rolling Boiler Plates.

An entirely new system of rolling plates for boilers is now being brought into practical application, and the first plant which has yet been erected is now being completed by Messrs. Daniel Adamson & Co., at their Hyde Junction Engineering Works, near Manchester, England. By this plant, which is termed "a vertical ring-plate mill," and which is being laid down from the designs of Mr. John Windle, of Manchester, circular weldless boiler plates, 4 feet wide and up to 16 feet internal diameter, can be produced, so that a boiler can be built up without any longitudinal seams. This plant is being built for the Victoria Steel and Forge Co., at Barrow, and is throughout of very massive construction. The rolling mill is carried on a foundation base-plate 35 feet in length by 17 feet in width, and weighing about 90 tons. The main driving roll is 22 inches in diameter and 4 feet wide between the flanges, and the bearings are 12 inches diameter in the necks. The set-up roll, which works vertically against the main roll in much the same way as the top roll in an ordinary horizontal mill, is 18 inches diameter and has a total range of 16 inches, the pressure against the main roll being given by hydraulic power. The weight of the mill complete is about 140 tons, and it is driven by a pair of powerful engines by means of a vertical spindle geared to the engines, which are placed directly underneath. The gearing is effected by a pair of steel bevel-wheels, 7-inch pitch and 21 inches across the teeth, each wheel weighing upward of 12 tons. The bottom of the vertical shaft is carried upon a foundation base with footstep and pedestals weighing upward of 30 tons. The engines are of the horizontal type, and have 40-inch cylinders with 4 feet stroke. The crank-shafts are 27 feet long, 16 inches diameter in the necks, and are divided in the center by means of solid flange couplings. The crank-pins are 10½ inches in diameter and 11 inches long. The cylinders are fitted with the Wheelock patent automatic expansion gear, which can be adjusted by hand from the different platforms without any throttle-valve being used, the intention being to get as nearly as possible boiler pressure on the piston at all grades of expansion. The engine-bed is of the truncated guide type, bored out for the reception of the slides, the flange connection to the cylinder being faced at the same operation, thus insuring perfect accuracy. The engine complete will weigh about 140 tons, and at 100 revolutions will work up to 3000 indicated horse-power. The total weight of the plant when fitted up complete will be nearly 300 tons.

A Long-Line Telephone Test.

A correspondent of the *Electrical Review* writes the following letter from Buffalo to that journal, under date of the 1st of November: "A little experiment was tried here to day which may interest you and the telephone boys. At 10 o'clock to-day Messrs. Uline and Cull, of Albany, and Messrs. Coles and Palmer, of Buffalo, and F. W. Harrington, of the Western Electric Co., secured a Western Union wire, No. 4 iron wire, and connected at each end one of the new long-distance transmitters. It was found that five cells of Leclanche were about right, and for the first time we carried on conversation with Albany. We could hear and make them understand perfectly. It was a grand success. Mr. Uline afterward called up Rondout, and we could hear them. They used an Edison with three cells Leclanche. After that we connected in Rochester, at the end next to Buffalo; then to Albany—Rochester using a long-distance transmitter. Buffalo remained on the loop, and Rochester carried on good conversation with Mr. Uline at Albany. The distance by wire is, Buffalo to Albany, about 325 miles; Buffalo to Rochester, 89. So you see we worked the transmitters over 414 miles with good success. We used a copper wire from Rochester to Buffalo, and from Buffalo to Albany a No. 4 iron. Afterward we talked with Mr. Baker) at Toronto, and with Bradford, Pa., with good success."

The Separation of Liquefied Air Into Two Liquids.

The laws of the liquefaction of atmospheric air are not those of the liquefaction of a simple gas. If at first sight air presents itself in such a manner that it is permissible to speak of the critical point of the air, this depends merely on the slight difference which exists between the curves of tension of watery vapor, of oxygen and nitrogen. While the vapor tension of the liquid evaporated by the pump continually diminishes in a progressive manner, the temperature passes through a series of maxima and minima. Under low pressures it ultimately arrives at values little higher than those presented by pure oxygen at the same pressure. In these conditions the air contains merely a very slight quantity of nitrogen. Air can further yield two quite distinct liquids, different in appearance and composition, the one superimposed upon the other, and separated by a perfectly visible meniscus. S. Wooblewski arrived at this result as follows: After having liquefied at 142° a quantity of air in the tube of his apparatus, he allows such a quantity of gaseous air to enter the tube that the pressure of the gas is equal to 40 atmospheres, and its optical density equal to that of the liquid. The meniscus of the liquid is effaced and disappears entirely. He then slowly diminishes the pressure, and at the moment when the gauge shows a pressure of 37.6 atmospheres a new meniscus appears at a point of the tube much higher than that occupied by the meniscus which has disappeared. A few moments afterward the old meniscus returns to the point where it disappeared, and at this moment two liquids are distinctly recognized and remain separate for some seconds. The lower liquid contains 21.28 per cent. by volume of oxygen, and the lower 17.3 to 18.7 per cent.

Two New "Print" Processes on White Ground.

A new process known as "Shawcross's patent sensitized paper," the lines of which are black and the background white, has recently been introduced in England, in which the manipulation is exactly similar to the ferro-prussiate process. Mr. Shawcross's sensitized paper is originally of a bright yellow color and possesses the following properties: If immersed in water the paper rapidly turns black, or if first exposed to direct sunlight it is bleached and assumes a pure white face, after which water has no effect upon it. From a statement of these two properties the method of manipulation in order to produce a copy of a tracing can readily be conjectured. All that is necessary is to place the tracing (which should be on a pure white or bluish shade paper) on the top of a piece of sensitized paper, taking care that no creases exist and that contact between the two is perfect over all the surface. Then by exposing the whole to the light that portion of the prepared surface immediately underneath the lines of the tracing remains unaffected, while the whole of the remainder is bleached, so that when the process is complete we have an exact copy of the tracing in yellow. These lines will immediately turn black when the paper is immersed in water, giving the desired copy. The usual precautions must be observed in working with the paper, viz., not to expose it unnecessarily to the light, to immerse the yellow tracing first in still water, and afterward wash thoroughly in relays of clean water to complete the print. If these cautions are observed, a clear and distinct copy of the original will be produced. The operation is facilitated by using a printing frame and a piece of felt on the back of the paper to give a uniform pressure while being exposed to the light. Thus the process is a direct positive one, and produces *fac-simile* copies of the tracings by the very simple operations of exposing to light and washing in water no chemical baths being required. The paper is sold in rolls of 11 yards long and 29 inches wide, by George J. Poore & Co., stationers, Castle street, Liverpool.

Mr. A. H. Haig has described, at a meeting of the Engineers' Club of Philadelphia, the following process for making photographic copies of drawings in blue lines on white background, which was invented by H. Pellet, and is based on the property of perchloride of iron of being converted into protochloride on exposure to light. Prussiate of potash, when brought into contact with the perchloride of iron, immediately turns the latter blue, but it does not affect the protochloride. A bath is first prepared consisting of 10 parts perchloride of iron, 5 parts oxalic or some other vegetable acid and 100 parts water. Should the paper to be used not be sufficiently sized, dextrine, gelatine, isinglass or some similar substance must be added to the solution. The paper is sensitized by dipping in this solution and then dried in the dark, and may be kept for some length of time. To take a copy of a drawing made on cloth or transparent paper, it is laid on a sheet of the sensitive paper and exposed to light in a printing frame or under a sheet of glass. The length of exposure varies with the state of the weather from 15 to 30 seconds in summer to from 40 to 70 seconds in winter, in full sunlight. In the shade, in clear weather, 2 to 6 minutes, and in cloudy weather, 15 to 40 minutes may be necessary. The printing may also be done by electric light. The print is now immersed in a bath consisting of 15 to 18 parts of prussiate of potash per 100 parts of water. Those parts protected from the light by the lines of the drawing immediately turn blue, while the rest of the paper, where the coating has been converted into protochloride by the effects of light, will remain white. Next the image is freely washed in water and then passed through a bath consisting of 8 to 10 parts of hydrochloric acid to 100 parts of water, for the purpose of removing protoxide of iron salt. It is now again washed well in clean water and finally dried, when the drawing will appear in blue on a white background.

The Van Rysselberghe Telephone System.

Since 1882 the eminent Belgian physicist, M. Francois Van Rysselberghe, has been at work perfecting a most ingenious system of long distance telephony, which at length comes forth from the ordeal of numerous practical tests a demonstrated perfect success And not the least surprising feature of this matter is the boldness of the step which M. Van Rysselberghe has taken, for, instead of carefully avoiding, so far as possible, the busy, rattling telegraph wires, he seizes the bull by the horns and applies his instrument directly to them, producing perfect harmony where there was confusion before. This feat has been accomplished by

the utilization of a principle as simple in itself as it is applicable to the purpose, and that is that the telephone will not audibly respond to a current which is not abrupt in its rise and fall; a current which increases and decreases gradually will not make its presence apparent to the ear, although it will cause vibrations of the diaphragm. If the currents used in telegraphing be so modified, it then becomes possible to send the two sets of signals along the same wire and through the same instruments without interference, for the telephonic currents are too feeble to affect the telegraph instruments. This is the fundamental principle upon which M. Van Rysselberghe has built his system. The method of reducing the abruptness of the telegraphic signals is by the introduction into the circuit either of condensers or small regulating electro-magnets or of a combination of both, which latter gives the best results. Thus a portion of the pulsation of the strong current is absorbed for an instant, causing its reduction to a point where it ceases to give audible effect upon the telephone, and, furthermore, is too gradual in its rise and fall to cause material induction.

To protect the secrets of the telegraph two separate wires with no metallic connection may be used, with a condenser of small capacity at either side of which they are connected. The modified telegraph currents will not act across the dielectric, while the alternating microphonic currents pass from one side of the condenser to the other and to the telephone without difficulty. The most striking exhibition of the successful operation of the Van Rysselberghe system has been given at the Antwerp Exposition, where vocal and instrumental music has been transmitted clearly from Brussels to Antwerp, a distance of about 30 miles. Preliminary experiments were first undertaken under the direction of a committee appointed at the suggestion of M. Delarge, Director of Telegraphs in Belgium, and composed of three delegates—M. Banneaux, engineer-in-chief in the Telegraph Department; M. Clement de Cazenave, engineer to the Bell Co., and M. Francois Van Rysselberghe. The experiments were eminently successful, and on September 1, 1884, the committee listened to concerted music and solos performed by the band at Brussels. We are indebted to London *Engineering* for the following description of this installation:

"Six microphones of a new type devised by M. Van Rysselberghe were attached to two of the small columns of the music kiosk in the Vauxhall (Brussels) at about the same hight as the instruments. These microphonic transmitters were all arranged in quantity, were connected with a Faure accumulator and connected by a special double wire fixed by the Bell Telephone Co. as far as the central station. Hence the circuit was extended with a double wire, to avoid induction, communicating with the office of M. Delarge, where two Bell transmitters were introduced into the circuit, which was then extended as far as Antwerp."

M. Van Rysselberghe subsequently, by means of the ordinary telegraph wires, transmitted to the Royal Chalet at Ostend, from the Theater Royal de la Monnaie, selections of vocal and instrumental music without interruption of the telegraph service. So satisfactory was the operation of this installation that a permanent one has been placed between the Monnaie Theater and the Laeken Palace at the express desire of the Queen. At the Antwerp Exhibition a room has been fitted up by the commission for this system, and contains 75 receivers, so that 35 persons can be admitted at a time and listen to the concert being performed 30 miles away at the Vauxhall Gardens, in Brussels. We learn that the Van Rysselberghe system is shortly to be installed between Paris and Rheims.

The Electric Conductivity of Metals.

M. Lazare Weiler, in a paper read before the Société Internationale des Electriciens, says: The conductivities of different metals, as compared with silver and pure copper, are given in the following table:

Silver	100.00
Copper, pure	100.00
Copper, refined and crystallized	99.90
Bronze, silicious, telegraphic	98.00
Copper and silver alloy, equal parts	85.65
Gold, pure	78.00
Copper with 4 per cent. of silicon	75.00
Copper with 12 per cent. of silicon	54.70
Aluminium, pure	54.20
Tin with 12 per cent. of sodium	46.90
Silicious bronze, telephonic	35.00
Copper with 10 per cent. of lead	30.00
Zinc, pure	29.90
Phosphor-bronze, telephonic	29.00
Brass, silicious, 25 per cent. zinc	26.49
Brass with 35 per cent. of zinc	21.50
Tin phosphide	17.70
Gold and silver alloy, equal parts	16.12
Swedish iron	16.00
Tin, pure, Banca	15.45
Antimony, copper	12.70
Aluminium-bronze	12.60
Siemens steel	12.00
Platinum, pure	10.60
Copper with 10 per cent. of nickel	10.60
Cadmium, 15; mercury 85	10.20
Bronze, mercurial, dronier	10.14
Arsenical copper, 10 per cent. arsenic	9.10
Lead, pure	8.88
Bronze containing 20 per cent. tin	8.40
Nickel, pure	7.89
Phosphor bronze with 20 per cent. tin	6.50
Copper with 9 per cent. phosphorus	4.90
Antimony	3.88

In regard to iron, steel, lead, zinc and tin, the results in the table are not insisted upon, and it is sufficient to consider them in connection with the results previously found. Speaking of the conductivity of alloys, M. Weiler thus decides an important mooted point. "It should be remarked," he says, "that it is not true, though sometimes asserted, that in an alloy the electric conductivity is always lower than that of the poorest conductor of the constituents. It is simply demonstrated that the union of two bodies modifies to a great extent their separate conductivities, and this fact ought certainly to lead sometimes to interesting results." It is worthy of notice that copper is now given an equal conductivity with silver, which is a direct commentary upon the improved quality of output since Mathiessen's determination.

A Wind-Producer.

A novel apparatus has been constructed by M. Rougerie, a priest of Pamiers, in France, and brought recently before the French Academy of Sciences. It gives rise to air currents similar to the great winds of the earth's atmosphere, and hence its name, the *anémogène*. The apparatus consists of a small artificial terrestrial globe put into rapid rotation in the surrounding air. In fact, it is a miniature of the earth, and by its rapid rotation gives rise to air currents resembling the trade and other dominant winds of the world. These currents are shown by girouettes placed round the globe at small intervals, like the wind marks on the French marine charts. The apparatus reveals the following facts: 1. The northeast and southeast trades are reproduced and the equatorial zone of calms caused by their meeting. The gentle breezes from north and south, which disturb the equatorial calms, are also seen. So is the overthrowal of the northeast trade in the southwest monsoons in the gulfs of Oman and Bengal. A great ascendant equatorial current in the equatorial regions is also shown, and a descending current near the Azores under the center of maximum barometrical pressure of the North Atlantic. There is likewise a descending current indicated between St. Helena and the meridional coast of Africa, under the center of maximum barometric pressure of the South Atlantic. At the poles there is a current descending from the zenith. The southeast trade at the Canaries is represented, while at the same time a south wind blows at the summit of the Peak of Teneriffe. Ascending currents from the east and west over Central America combine with the upper returning current of the northeast trade, thus explaining how the ashes of the volcano of Coseguina, on Lake Nicaragua, were transported to Jamaica during the irruption of the 25th of February, 1835. Owing to the defects of construction, the *anémogène*, however, does not reproduce in a perfect fashion the variable winds between the tropic of Cancer and 50° N. latitude, nor the corresponding winds between the tropic of Capricorn and 50° S. latitude. In the same way the southwest and northwest winds of 50° N. and S. latitude are not very faithfully imitated.

Freights on Indian and American Wheat.

According to the *Railroad Gazette*, the Indian wheat-growers are helped to compete for the supply of the European market by very low ocean rates, recent quotations being at the rate of 16 cents a bushel from Calcutta by steam, and 12 cents from Bombay, and they have been about one-third lower. The distance is more than twice as great from Bombay (via Suez Canal) as from New York; the present rates about four times as great; but formerly the difference was much greater in favor of New York. For about a year and a half the railroads from the interior wheat districts in India to the seaports have given rates on wheat about equivalent to 32 cents per 100 pounds from Chicago to New York. There are no such long hauls to the Indian "trunk lines" on which these low rates are made as there are in this country west of Chicago, but there are not many railroads of any kind, and very poor highways, so that the cost of transportation from the field to the sea is probably usually greater than in this country from Kansas or Dakota by rail. The current rate frow St. Paul to New York is 35 cents per 100 pounds. By lake and canal it is much less—from Duluth to New York about 19 cents now just before the close of navigation, while during most of the season past it was not more than 13 cents. Thus, our producers still have an enormous advantage over the Hindoos in the cost of transporting their wheat to the European market, and the latter are able to compete only by accepting prices which no one would grow wheat for in this country.

It may be urged that, as the cost of transportation from India is still much higher in proportion to distance than the cost here, a reduction to a level with our rates is likely to give India the whole trade; but it must be considered that India is not a new, thinly-peopled country, with a vast area of land waiting to be brought under cultivation, but an old and densely-peopled country (average population about 165 per square mile, while New York has 107, New Jersey 162, Pensylvania 95, Connecticut 129) in which the population always presses close on the means of subsistence, so much so that the largest exports so far have been but 0.2 bushel of wheat per inhabitant, while our exports of wheat are usually more than 2 bushels and sometimes more than bushels per inhabitant. A very slight change in the population or industries or mode of living in India would cause it to require its entire production. A rate of increase in population in India for less than two years such as we have here would require more grain than the Indian exports have ever been in one year.

Culm in Manufacturing.—The most extensive axle works in the country, employing an average of 1000 hands, is about to be removed from Auburn, N. Y., to Scranton. There was no scarcity of labor at Auburn—no inadequacy of transportation facilities, no burdensome taxation and no disadvantageous remoteness from market. At Auburn, owing to the cost of transportation, fuel was found a very costly item, while at Scranton it is to be had at a comparatively nominal cost. Experiment and experience have of late years demonstrated the feasibility of utilizing culm—or, as it is more commonly known in the anthracite region, "coal dirt"—in the generation of steam, and this heretofore useless product of the mines appears to be destined in the future to prove an important factor in the manufacturing world. While the cost of its transportation to distant points would still render it comparatively expensive, it may be had in the vicinity of the mines at a merely nominal cost, while the supply already stacked up about the collieries is practically inexhaustible, yet will be steadily augmented in the preparation of coal for market.

Speaking on the Bower-Barff process for protecting ironwork against rust, Herr Bokelberg, in a paper before the Hanover Section of the German Society of Engineers, calls attention to an important fact. He states that iron covered with a coat of magnetic oxide is in shape to have enamel put on directly, and that it prevents the cracking off of the enamel during burning, which otherwise happens occasionally.

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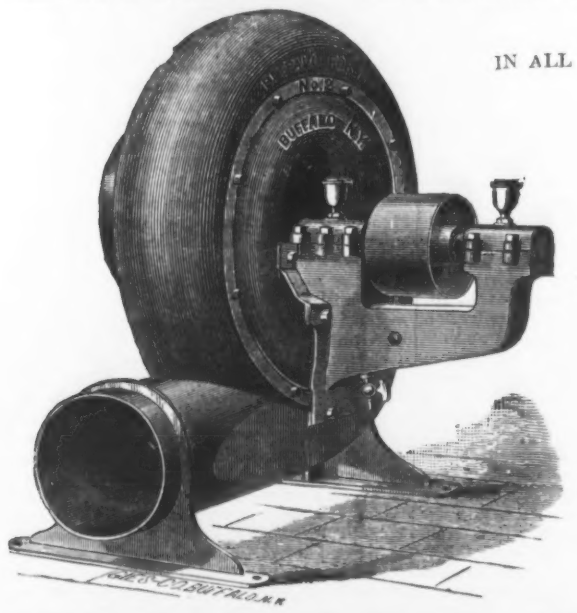

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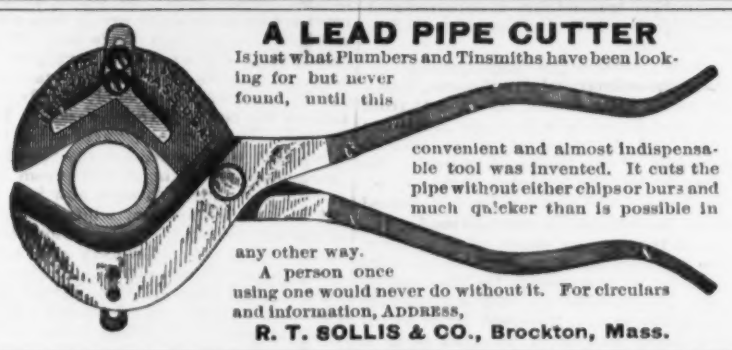

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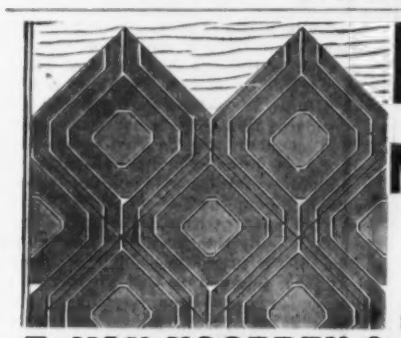

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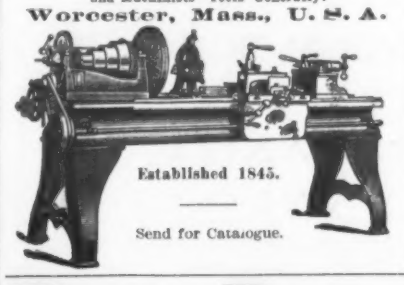

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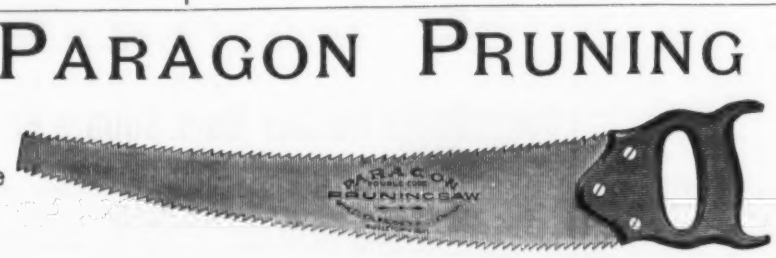

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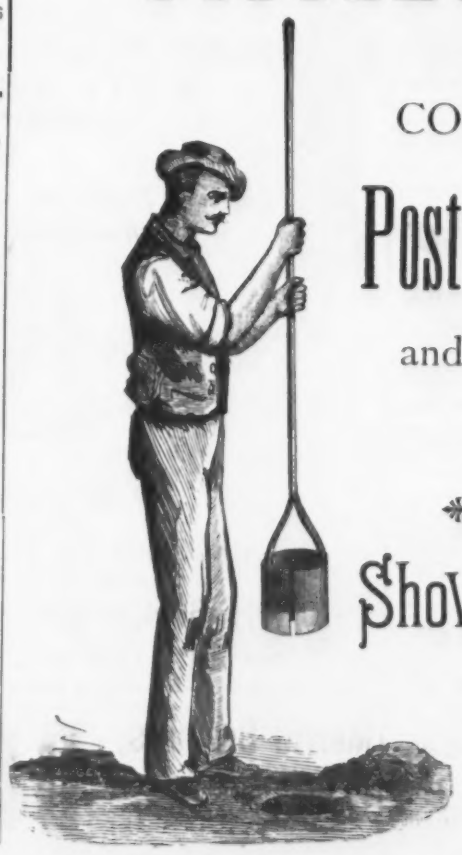

PRICES QUOTED ON APPLICATION.

Additions to the British Navy.

An English newspaper gives the following account of the work now going forward in the construction of war vessels and that contemplated:

The Hero, to be floated out of dock at Chatham, will be a useful addition to the strength of our armor-clad fleet. She is a steel-built, armor-plated turret ship and ram, and may be described as another Conqueror or an improved Rupert. Her displacement is 6200 tons and her engines are of 6000 horse power, driving twin screws, the estimated speed being 15½ knots per hour. The length of the ship is 270 feet, with an extreme breadth of 58 feet, the draft being 22 feet forward and 24 feet aft. Her crew, all told, will number 284. The armament includes two 43-ton breech-loading guns carried in one turret, and four 6-inch breech-loaders on sponsons. The maximum thickness of the armor is 12 inches.

Further progress in the development of the armor-clad fleet is indicated by the recent decision of the Admiralty to commence the construction of two first-class ships of war, namely, the Trafalgar and the Nile. These will be sister ships of 12,000 tons displacement, and with engines capable of imparting a speed of 16 knots. The armor will have a maximum thickness of 16 inches, and the type of the ship may be described as that of the Dreadnaught. In the increased length and hight of the citidel and in the extra length given to the armor belt the design of these ships appears intended to meet the objections which have been urged against the Inflexible. The armament will consist of four breech-loading guns of about 66 tons weight, with an auxiliary armament of guns probably possessing a caliber of 6 inches. The Trafalgar is to be built at Portsmouth and the Nile at Pembroke. In size these ships will equal the Inflexible.

An important element in the future strength of the navy is represented by sundry protected or belted cruisers of 5000 tons displacement. They will somewhat resemble the Mersey, but they will be considerably larger. Five are being built by contract, namely, the Australia, Galatea, Narcissus, Orlando and Undaunted. One, to be called the Aurora, is to be built at Pembroke, and another, the Immortalité, at Chatham. The five to be built by contract are well in hand; the two to be constructed in the dockyards are only just ordered. The characteristics of these ships will be considerable hight of freeboard, great coal-carrying capacity, and a high rate of speed. It is expected that these vessels will make from 18 to 19 knots per hour, a speed to be obtained by means of triple-expansion engines working up to 8500 horse power. The length of each ship will be 300 feet, with a breadth of 56 feet, the draft being 19 feet 6 inches forward and 22 feet 6 inches aft. The armament will consist of two 9.2-inch 22-ton breech-loading guns, 10 6-inch guns of 89 cwt., and some smaller weapons. The steel-faced armor forming the belt will be 10 inches thick, extending two-thirds the length of the hull.

Six vessels of the Archer type are being built for the Admiralty by Messrs. J. & G. Thomson, of Glasgow. These are the Archer, Brisk, Cossack, Mohawk, Porpoise and Tartar. Two others, the Serpent and Raccoon, are being built at Devonport. These eight vessels are twin-screw torpedo cruisers of 1630 tons displacement, with engines working up to 3500 horse-power, estimated to give a speed of 17 knots. The armament is to comprise six 89 cwt. breech-loading guns worked on sponsons. Orders were given a few days ago for the construction of a twin-screw composite gun vessel at Sheerness, to be called the Buzzard. This will be a sister ship to the Swallow, the displacement being 1040 tons and the engines of 1000 indicated horse-power. She will carry eight 5-inch breech loading guns. This class of vessel is unarmored, but protection is given by a steel deck below the water line. The estimated speed is 14 knots. Three vessels of high speed as torpedo boats and gunboats are to be laid down in the Royal Dockyards, the Sandfly and the Spider at Devonport, and the Grasshopper at Sheerness. These small craft will only be of 450 tons displacement, but their design is very peculiar. Of the ships that are being brought forward mention may be made of the large and powerful armor-clad, the Camperdown, 10,000 tons displacement and engines of 7500 horse-power. This vessel is now approaching the period when she will be launched. She will carry 10 guns, including four of 63 tons. The Anson, another of the Admiral class, is well advanced.

Municipal Gas Works in England — At the end of March last the total amount which local authorities in the United Kingdom had been authorized to raise for the purpose of gas supply was £21,958,700, and the amount to which they were actually indebted was £18,758,900. The receipts for the year amounted to £4,334,100, and the expenditure, exclusive of the interest and other debt charges, was £3,066,400. The net revenue thus amounted to £1,267,700, of which £894,800 were absorbed by the charges for loans and annuities, or in additions made to sinking funds, leaving £372,900 as the net profits for the 12 months. In the operations for the year 2,643,000 tons of coal were carbonized, 26,120,492,000 cubic feet of gas made, and 23,813,678,000 cubic feet sold.

An engineering scheme, which for the present is likely to exist on paper only, is explained in the columns of a contemporary. It originated, we believe, with Mr. John C. Goodridge, Jr., a well-known inventor and engineer of this city. It has for its object changing the temperature of the Atlantic States by obtaining more of the benefit of the Gulf Stream. Mr. Goodridge assumes that the reason we do not get the benefit of it now is that we have between us and it a polar current, coming down along the coast of Labrador, through the Straits of Belle Isle, and forming the cold western wall of the Gulf Stream. The existence of this current is well established, and, in fact, is one of the facts on which the official sailing directions both in this country and England are based. What Mr. Goodridge proposes is that it should be stopped in the Straits of Belle Isle by a dam at a point where it is about 10 miles wide and 150 feet deep. The dam, he says, could be built with the adjacent rocks, and the cost would not exceed $40,000,000. The effect of this would be, he calculates, to change the temperature of the coast from Cape Hatteras to Newfoundland. Nova Scotia would have a climate as mild as Cape May, and Block Island and Cape Cod would become winter watering places. Moreover, the St. Lawrence would be open to navigation throughout the year. Mr. Goodridge also thinks, though not with much positiveness, that the deflection of the Arctic current might turn the Gulf Stream further southward, and thus cut off enough heat from the British Isles to give them the climate of Labrador, and then, giving the reins to his fancy, he sees the Queen abandoning her icy Kingdom and taking refuge as Empress in India. But all this is too much to expect for $40,000,000.

NEW PUBLICATIONS

MEMORIAL TECHNIQUE UNIVERSAL. L. Mazzocchi. H. L. Soudier, Paris; L. W. Schmidt, 7 Barclay street, New York. Price, $1.50.

With the active co-operation of a number of engineers, M. L. Mazzocchi has compiled an engineers' pocket book, in the French language, which for compactness and its wide range of subjects is admirably designed for the object intended. We find in it a table of squares, cubes, roots, logarithms, circumferences and areas of circles for numbers up to 1000; lengths of arcs and area of segments; weights and measures, ancient and modern; interest formulæ, with tables of coefficients, a series of arithmetical and geometrical formulæ, and tables with applications to masonry and architecture, and a summary of surveyors' problems. This is followed by the use of materials in construction, including within the range those used by the architect and builder, by the civil engineer and the constructing engineer generally. Then there are figures on foundations, on the thickness of walls, the design of trusses and roofs, the excavation of earth, the building of retaining walls and stone arches and bridges. Next, M. Mazzocchi devotes attention to mechanics, friction, the transmission of power, pumping, air-compressors, turbines, boilers, chimneys, locomotives and stationary engines, giving numerous tables. Another chapter takes up hydraulics, water service, irrigation and drainage. Then come thermodynamics, and brief references to acoustics, optics and electricity. There are chapters, too, on physical geography and chemistry, the work being concluded with a brief dictionary of technical terms in four languages, and an index. It will be noted that an enormous amount of useful information has been crowded into the 421 small pages which go to make up the book.

THE PREVENTION OF LOSS BY FIRE AND THE SYSTEM OF FACTORY MUTUAL INSURANCE. By Edward Atkinson, Boston, Mass.

At the request of a number of mutual fire insurance companies—the Western, of Chicago; the Millers' and Manufacturers', of Minneapolis; the Central, of Van Wert, Ohio, and the Manufacturers' and Merchants', of Rockford, Ill.—Mr. Edward Atkinson, of Boston, delivered an address at Minneapolis on the 17th of September. It is this address which is now before us. Mr. Atkinson is well known as a vigorous writer, and his views on factory mutual insurance are undoubtedly well known to our readers through earlier publications. What makes the present pamphlet one of particular interest is that it goes into the details of the methods adopted by the company with which Mr. Atkinson is identified to prevent loss by fire. They are in the main extracts from various special reports published by him, but are here brought together in handy form as appendices, to which Mr. Atkinson supplies the general connecting thought in his address. There are drawings with details and estimates of cost of one and two story mills, fire-escapes, fire-doors, belt-boxes, sprinklers, &c. We can heartily recommend a careful perusal of the work, and trust that it may lead to a more general introduction of the system of factory mutual insurance companies.

Contingent Patent Fees.

In the annual report of the late Commissioner of Patents to Congress, relative to the evils arising from this source, Mr. Butterfield said: "This tendency is aggravated by those who solicit patents upon contingent fees, or who, without special training or qualifications, adopt this business as an incident to a claim agency, and press for patents as they press for back pay or pensions. Such men are often more desirous of obtaining a patent of any kind and by any means than they are of obtaining one which shall be of any value to their clients. Inventors are often poor, uneducated and lacking in legal knowledge. They desire a cheap solicitor, and do not know how to choose one. They are pleased with the parchment and the seal, and are not themselves able to judge of the scope or the value of the grant. Honest and skillful solicitors, with a thorough knowledge of the practice of the office and of the patent law, and who are able and willing to advise their clients as to the exact value of the patents which they can obtain for them, may be of much service to inventors. There are many such, but those who care for nothing but to give them something called a patent, that they may secure their own fee, have in too many instances proved a curse. To get rid of their client and of their trouble, they have sometimes been content to take less than he was entitled to, while in many cases they have, with much self-laudation, presented him with the shadow when the substance was beyond his reach. Between such men and the office the strife is constant. They have the ear of their client, and to some extent of the public, and much of the misrepresentation of the spirit and character of the office is directly traceable to this source."

The Iron Age

AND

Metallurgical Review.

New York, Thursday, November 19, 1885.

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The Sliding Scale in the Anthracite Regions.

An Associated Press dispatch reports that a special meeting of the Executive Board of the Miners' and Laborers' Amalgamated Association, representing the anthracite region of Pennsylvania, has been called for Wednesday, November 18th, at Pottsville, for the purpose of making a formal demand upon the various coal exchanges for a guarantee that from and after October, 1885, no percentage will be deducted from wages below the so-called $2.50 basis. This action is taken upon an attempted reduction of 3 per cent. below this basis made by the coal exchanges in accordance with the selling price of coal at the present time. This action has reference to the workings of what is known as the "basis system," which is practically a sliding scale of wages based upon the selling price of coal. This system was first suggested by the general council of the Workingmen's Benefit Association, at a meeting held at Hazelton, May 11th, 1869, and was agreed to in September of that year, ending a strike which had been in progress from May 10. This sliding scale, with those adopted in the iron trade in the Pittsburgh district and in the nail trade in New England, is among the earliest examples of sliding scales in this country—possibly in any country. They are also among the earliest practical recognitions of the truth now generally accepted by economists that wages are paid out of product, and consequently they should bear a certain relation to the price received for that product. In all three of these industries this method of paying wages has continued in operation until the present time. It is the unwritten law of the anthracite regions, and, while under its operation, or, rather, to arrive at a basis, some very important and long-continued strikes have occurred, the basis system has nevertheless been constantly in force, and has done away with the constant annoyance of petty strikes about wages. The basis and the scale once settled, during its operation there has been no question as to the rates of wages to be paid.

Under the operations of the basis system at the present time, in the Schuylkill region, for example, from a list of all the collieries in this region shipping over a certain amount of coal, 20,000 tons, we believe, five collieries are drawn at the beginning of each month to furnish the price of coal sold during the previous month, and the average of these prices determines the rate of wages to be paid for that month. Thus in the month of August, 1885, the five collieries drawn and the ascertained selling price of coal during the month of August were as follows:

Elmwood colliery, (P. & R. C. & I. Co.)	.....	$2.43⅛
Reliance colliery,	do.	2.45
Kohinoor colliery,	do.	2.33
Knickerbocker colliery,	do.	2.45
Big Mine Run colliery, (J. Taylor & Co.)	....	2.30

The average of these returns is 2.39\frac{5}{8}$, and the rate of wages to be paid for work done in August, 1885, is 4 per cent. below $2.50 basis. The collieries drawn for October and rates are as follows:

Locust Spring colliery, (P. & R. C. & I. Co.).		$2.17⅝
Conner colliery,	do. ..	2.47⅝
Eagle colliery,	do. ..	2.64⅜
Otto colliery,	do. ..	2.42
Kehley Run colliery, (Thomas Coal Co.)	.....	2.33⅜

The average of these prices is 2.40\frac{9}{16}$, and the rate of wages to be paid for work in October is 3 per cent. below $2.50 basis. On the $2 50 basis the wages are $12 per week for miners on days' work, $10.20 per week for inside labor and $8.10 per week for outside labor—wages on day work to be clear of all costs. The reduction or advance is 1 per cent. for every 3 cent change in the price, or for every fraction of 3 cents more than one-half. During the continuance of this system, minimums, or prices below which the selling price of coal shall not fall, or, if it does, wages shall not fall below the rate provided for at this minimum, have been fixed. The action of the Miners' and Laborers' Amalgamated Association indicates that they are striving to fix this minimum basis at $2.50, instead of, as at present, consenting to a system that permits of reductions below the prices paid on a $2.50 basis.

That in all sliding scales there should be a minimum or a selling price and its corresponding rate of wages below which wages should not be permitted to fall, is both reasonable and necessary. Without such a minimum there is a tendency to reduction of selling prices growing out of the knowledge that with such a reduction of selling price will come a corresponding reduction in rates of wages. While it is true that demand and supply will regulate these prices, it is also true that producers have it within their power not to change demand, but certainly to control supply, and thus to maintain prices. Where sliding scales are in operation a minimum below which wages cannot go will tend to the maintenance of prices in the face of competition and oversupply, frequently leading to the reduction of supply, and with it a maintenance of prices. There is a great deal of force in the plea urged by workingmen, when they are asked to accept a reduction, that the employers have it within their power to prevent the reduction of selling prices which make the reduction in wages necessary. Possibly it is not always true to the extent which the employees assert, but that they have this power to a certain degree, and can exercise it if they will, experience has shown. We are not sufficiently versed in the anthracite coal trade to decide whether the $2.50 basis, with the prices paid thereon, is the one that should be established as a minimum. It has been the minimum in the past in many cases where the wages are higher even than those now paid. Indeed, at one time the minimum was above $2.50, and in other cases provision has been made that the reduction below $2.50 minimum should not be operative for more than two months in the year. Possibly, however, there have been such changes in the conditions of work and prices as to make it imperative that there be a minimum lower than $2.50. As to this we cannot say, but the whole theory of sliding scales and their practical application in industries show the necessity of a minimum below which wages shall not go, and this necessity exists not only for the protection of wages, but of prices as well.

A somewhat unique struggle is going on in the Russian iron trade. In 1882 the duties on manufactured iron were materially advanced, while pig iron received only little additional protection. The German works, which had until then found the Russian market a very remunerative one, were equal to the occasion and promptly built large works on the other side of the frontier, importing the pig iron from their works in Silesia. Russian iron-masters protested, and as the result of their efforts the duty on pig iron was advanced in 1884 from 6 to 9 kopeks per pound, and in 1885 were put up to 12 kopeks. Now another rise has been decided upon to 15 kopeks, to go into effect in March, 1886, and not content with past successes the Russian producers are at work for still more. A conference between them and the authorities is called for early in December. The home producers claim that the German branch establishments are aided by special rates of freight on the railroads in the Fatherland, while the native works in the Oural Mountains, in Nishni-Novgorod, Pensa and Vladimir are hampered by lack of means of cheap transportation. Some claim that the Government should build the railroads and give the works ample orders, while others insist that duties be further advanced to give the home industry a chance against the branch establishments of foreign corporations. It may be of interest to add that Belgian spinners are doing in the German textile trade exactly what German iron-masters have done in Poland. When an increase in duties went into force they transferred works and workmen bodily into Germany.

New Markets in the East.

A crisis in the affairs of Burmah affords England the opportunity for a grand commercial conquest. She finds it necessary to intervene by force of arms, ostensibly for the protection of her own subjects, within the jurisdiction of King Thebaw, but really to prevent the defeat of long-cherished schemes looking to the extension of her Indian Empire. More than this, to hesitate in adopting a vigorous policy is to permit a formidable rival to intrench herself on her Eastern Indian frontier in such a manner as to erect a military barrier directly on the line of proposed railway communications with China and Siam. The dominions of King Thebaw are compared to a narrow wedge driven between the two most populous Empires in the world, a territory bisected by the fertile valley of the Irrawaddy, and capable of being made the focus of a lucrative caravan trade with the inhabitants of Southeastern Thibet and the adjacent States. It is in this promising field that the French, repulsed in Tonquin, seek to retrieve their fortunes, having already entered into treaties designed to secure a monopoly of the great teak forests, in opposition to a British trading company lately in control; also exclusive banking privileges of no mean importance, the latest concession conferring the right to issue bank notes which shall have a forced circulation throughout the kingdom.

Simultaneously with these events a radical change of policy marks the course of the Chinese Government with reference to railroads and other internal improvements. To England especially it is full of significance. We may readily conceive that a plausible pretext for asserting her authority in Upper Burmah would be availed of with eager alacrity, and that the hostility of Thebaw might, under existing circumstances, so far from being deprecated, excite a grim delight. A leading exponent of British opinion says, perhaps inadvertently: "With Upper Burmah in British hands, or under supreme British influence, we can fix no limits to the value of the trade which would be presently opened up with China." And again: "If we are to have the advantage of the new awakening of China, we must be able to command the approaches to the country, or at least to make sure that they will not be closed to us either at the caprice of a local potentate or at the dictation of a jealous rival." The splendid possibilities here suggested, being nothing less than access to the greatest unopened markets of the world, as described by that well-known traveler and intelligent observer, A. R. Colquhoun, may well excite the ambition and quicken the energies of the entire mercantile world.

In the face of present exigencies requiring decisive action, the question of moral right may seem to have little place in governing the course of England with reference to her interests in the East. It may seem irrelevant to charge that the petty sovereign of Upper Burmah, whose subjects number only between 3,000,000 and 4,000,000, is a lawless despot, or that misrule within his own dominions is a constant menace to the peace of neighboring populations. The simple fact is that for half a century British influence in the dominions of King Thebaw has been paramount, and that the British commissioner at Mandalay, the capital city, has controlled the leading trade interests from which the treasury derived its revenue. The relations of the Hudson Bay Company to the British possessions in the Northwest seem to have a close parallel in those of the rich British corporation known as the Bombay-Burmah Company in their relations to King Thebaw. When the latter saw fit to repudiate existing contracts, to demand exorbitant indemnities for imaginary wrongs, and finally to threaten general confiscation of all visible effects, it was but natural that England should object to treaties with her ancient rival, recognizing a new claimant and successor to all the advantages, present and prospective, resulting from long occupation of the soil.

While conjecture may be allowed to take a wide range in picturing the possibilities of the Anglo-Saxon race shaping the commercial destinies of both China and India, the fact presses into notice that a collision of interests may engage England and France in disastrous hostilities, while each is playing for enormous stakes. Already the intimation comes from Paris that the British expedition to Burmah is really a blow aimed at France.

A series of attacks is being made upon nearly all the bureaus of the Government in which strictly scientific work is in progress under the auspices of the United States. The Coast Survey, the Fish Commission and the Geological Survey have in turn been assailed. Unfortunately those who are trying to make capital for themselves in this manner are doing it in a clumsy, unjust way, which cannot lead to any good. Let it be said at once that there is much room for improvement in the manner in which the expenditure is made of the large sums lavishly appropriated by the Government every year. Even those who may claim to be judges of the value and utility of the scientific work done are ready to concede that it costs more than it should. Some reform is needed, undoubtedly, but where retrenchment should be practiced or the service should be improved is a question which should not be left to men who are incapable of appreciating the value of scientific work to the country at large. It is folly to condemn it all because there are some abuses. If those in charge of it were wise they would by prompt measures disarm criticism and rally to their support the friends of science who are now lukewarm. It would give a standing to those whose loyalty leads them to the much more dangerous position of denying that anything is wrong. In the mass of wild accusation now hurled at the scientific bureaus there are some grains of truth. They will come out and give a strength to these attacks which they would not otherwise possess. The most manly and the safest course would be to acknowledge it, and to guard against existing abuses and errors for the future.

Intervals of Wage Payment at Mills and Factories.

The question of intervals of payment at our factories, which has always been an important one, is now receiving much more attention than was formerly given to it. Establishments where there has been no change in this respect for a generation or more are now shortening the periods between payments. The Lowell cotton mills, that for many years have paid once a month, are changing, and hereafter pay will be weekly, generally Wednesday or Thursday, for the work done the previous week. In the early history of manufacturing in this country, when truck stores were quite common, it was customary to pay at long intervals—quarterly or every six months, and frequently only once a year—advances being made either in cash or store orders in the interim, with a settlement, as indicated, quarterly, semi annually or yearly. Furthermore, it is a fact that in this early time interest was charged the workman on advances of cash, though no interest was allowed on the deferred payments. These intervals have been gradually shortened until now the usual intervals of payment, differing somewhat with trades and localities, are weekly, semi-monthly or monthly. In some industries, however, even now it is necessary to make payments on account, with settlements at given periods, as in window-glass blowing, where the men have advanced to them what is termed "market money," with settlements at the end of the fire. This is made necessary by the fact that the pay of the men depends upon the quality of the glass produced, and the quality cannot always be ascertained until the rollers can be flattened and cut, which sometimes is many weeks after they are blown.

It is also an interesting feature in connection with this question of intervals of payment that late in the seventies in many industries there was a tendency toward lengthening the interval, establishments that had paid weekly or semi-monthly lengthening the interval to semi-monthly and monthly. The hard times and the stringency of money were probably the cause of this extension of the period between payments. There can be no doubt of the increased value to the workman of his wages when paid frequently. Consumers with money in their hand to make payments are always more eagerly sought after, and can consequently buy more cheaply, as they are in a position to transfer their trade from one dealer to another, than can those who have to buy on credit, and experience has shown that but very few workmen are forehanded enough to purchase for cash when the intervals of payment are monthly. It has been estimated by careful observers that weekly payments in many cases give an advantage of from 5 to 10 per cent. to wage-earners. There is, of course, more office labor involved in weekly than in monthly payments, but this is a small matter compared with the benefit accruing to the employee by the introduction of the shorter interval.

Dual Freight Classification in the West.

A very interesting struggle has been going on recently between the jobbers of Chicago, Milwaukee and St. Louis on the one side and the merchants of smaller towns in the West. The former urged that the railroads should not make any distinction between the freight rates on quantities of goods less than carload lots and on carload quantities. This dual classification on the same classes of freight made it possible, it was claimed, for the jobbers of smaller places like Kansas City, St. Joseph, Springfield, Omaha, Atchison, Lincoln, Leavenworth, St. Paul, &c., to take away the trade of the jobbers of St. Louis, Milwaukee and Chicago through the advantages accruing to them by the lower carload rates. Thus the trade of the country merchants who would otherwise go to the larger cities is turned over to the jobbers in the smaller towns. They plead that the railroads, in granting these carload rates, are simply throwing away money which would come to them if the goods were distributed from the large cities. On the other hand, an excellently-prepared memorial submitted by the officers of the boards of trade of a number of smaller towns contained a very strong argument. They ask whether the St. Louis and Chicago merchants, in demanding the discontinuance of the carload rates, intend to ask that all the freight business shall in the future be done at the retail rates. This naturally defeats the plea that the consumers are to be benefited by such a change, who in the present state of affairs practically share with the jobbers in the smaller towns the advantages accruing to the latter through the system now prevailing. It is urged that everything that facilitates business and cheapens cost increases consumption and thus gives additional traffic to the railroads, and that any effort to work against that tendency would be attended with the injury following the violation of the natural laws of commerce. It is pointed out, furthermore, that in practice the railroads must and do discriminate, as every merchant does, in their dealings with small and large customers, and that any attempt to place carload and less than carload rates on the same basis would inevitably lead to irregularities and end in demoralization of freights. The railroads can handle carload lots cheaper than they can smaller quantities, and therefore it is not more than just that the shipper should be given a share of the saving.

Such were, in brief, the arguments presented by both sides before the Classification Committee of the Western Railroads at the recent meeting in Chicago. It was understood that the jobbers of Chicago, however, well appreciated the fact that a total abolition of the carload rate difference was not possible, and their efforts were therefore chiefly directed toward securing a reduction in some of the differences in the dual classification. In this they were successful, and deserved to be, because the differences were in many cases excessive. In seven leading commodities the differences between carload and less than carloads between St. Louis and Missouri River points the railroad managers fixed 20 per cent. as the maximum difference, equivalent to 17 and 18 per cent. for Chicago. The outcome was therefore a compromise in which the excessive demands of St. Louis, who insisted upon total abolition, were put aside, while the other parties to the contest reached a fair basis.

Right to a Preliminary Injunction in a Patent Suit.

The ruling of Judge Treat, of the United States Circuit Court in Missouri, in the case of the Steam Gauge and Lantern Co. against the St Louis Railway Supplies Co., in which he refuses to grant the complainant a preliminary injunction, presents a point of peculiar interest in patent practice, both to the legal profession and to manufacturers of patented articles. It is well known that a patentee is not necessarily entitled to such preliminary relief against an alleged infringer as a matter of course, merely because he holds the patent. In order to obtain it he must show in addition that there has in reality been an infringement, or at least he must make out a *prima facie* case of infringement. Besides this, various other elements enter into consideration, as, for instance, how far and for what length of time there has been an exclusive possession or assertion of the right. It has also been held that the complainant is entitled to the injunction when he has successfully prosecuted other persons for infringing it. As a matter of fact, we suppose that in the great majority of cases the usual course is to grant the preliminary relief. Still, much remains in the discretion of the court. If the patent is of doubtful validity or contains defects the court has a right to refuse it. In fact, it was said by a very eminent patent jurist—Judge Curtis—that the application may be refused or granted unconditionally, or terms may be imposed on either party as conditions for making or refusing the order, and the state of the litigation where the plaintiff's title is denied, the nature of the improvement, the character and extent of the infringement complained of, and the comparative inconvenience which will be occasioned to the respective parties by allowing or denying the motion, must be considered.

Now the striking feature of Judge Treat's decision is that there had been a previous suit brought by the same complainant and patentee against other parties for the infringement of the same patent, and that the application for a preliminary injunction had been granted in that action by Judge Shipman, also of the Circuit Court of the United States. Yet Judge Treat, taking a different view of the merits of the case, and having some doubt of the validity of the patent, refuses to be bound or influenced by this prior adjudication. It would seem that under all the circumstances, and particularly considering the fact of Judge Shipman's order, the injunction asked for should have been granted for uniformity, if for no other reason. It appears to the layman like a striving for judicial independence merely for the sake of such independence. Even if the patent should be held invalid on the final hearing, no harm would have been done, as the complainant's counsel offered to give a bond of sufficient amount to indemnify the defendant for any

loss he might sustain by reason of the injunction. This offer was refused. Some deference, however, was paid to Judge Shipman, who, we may remark incidentally, is regarded by patent lawyers in the East as one of the ablest patent judges on the bench. The defendant was ordered to give a bond for $20,000, and to keep an account of all sales, to answer to any damages that may hereafter be found against him. This is made the condition on which he is allowed to go on with the manufacture of the patented lanterns. Of course this secures the patentee to a certain extent, but every patentee knows that under such circumstances an indefinite amount of damage is done to his business, for which, as he cannot directly prove it, he cannot be adequately compensated. We do not mean to criticise Judge Treat's decision, and we believe that, as these matters are almost purely discretionary, he is legally justified; still, as judges are influenced largely by precedent, even where they possess discretionary powers, we regret the introduction of this principle, which seems to be opposed to at least one previous decision, and does not seem to promise any corresponding advantage as an offset to the innovation.

The North Chicago Rolling Mill Co., not content with carrying off the palm for best furnace record, are in the field as competitors for the best Bessemer work. Mr. E. C. Potter the superintendent informs us that for the 24 hours ending 6 a. m., November 14th, the rail mill rolled 756 tons of rails, the total number of rails being 2597, of which 1354 were made on the day turn and 1243 on the night turn, one hour and 15 minutes being lost in changing rolls. The rails were of the Chicago, Burlington and Northern 66-pound pattern. During the same time the Bessemer works made 90 heats, aggregating 883 tons. This is the largest work ever performed in 24 hours.

We have become accustomed to see the anthracite coal trade managed in a high-handed manner, but nevertheless it is somewhat surprising to have even the semblance of disguise removed. Mr. Franklin B. Gowen, who is endeavoring to persuade the stockholders of the Philadelphia and Reading Railroad Co. to place him once more in charge of that property, is the one who has voiced that spirit when he says in a circular: "The price of anthracite coal is arbitrarily established by the few companies." Fortunately, that is true only with certain limitations, and, even if it were a fact, it would be a very unwise statement to make. There is a very strong sentiment steadily gaining in power with the public against the exercise of arbitrary power by corporations. It would be a calamity to many important industries dependent upon anthracite as a fuel if the spirit which animates Mr. Gowen were to gain the ascendency. They would be called upon to provide the funds to pay for the blunders made during Mr. Gowen's career, which have swelled the Reading securities to an unprecedented figure. Mr. Gowen roughly estimates that about 20 cents on tolls and 25 cents more for coal would provide money enough to pay interest and 6 per cent. dividend on the $127,000,000 of "junior securities" and shares. That is to say, every ton of anthracite coal used would have to sell at 45 cents more. In days of close competition that would simply lay idle the majority of the manufacturing establishments which could not easily get bituminous coal, and would sorely crowd others. Such a blight is not, however, likely to fall upon them. Let it be assumed that Mr. Gowen's honesty of purpose and his energy so impress those interested in the Reading Road that they forget that it was he who put them into the plight in which they are now. Could he as president of the company carry out the programme of getting so much higher tolls and better prices? We do not believe that he could. The other companies would be earning such enormous returns that the productive capacity, great as it is now, would be quickly increased beyond all bounds. In the race for supremacy harmonious action would soon give way to violent struggles, complicated by labor troubles. Mr. Gowen's outspoken antagonism of the Pennsylvania Railroad would place that great corporation in the position of a belligerent outsider. Without it, the arbitrary power of which Mr. Gowen boasts is a shadow. It would be different if that party in the Reading organization would prevail which is inclined to a compromise with the Pennsylvania company. Then fairly remunerative rates would be allowed to prevail, but they would certainly not be based upon figures permitting 6 and 7 per cent. on Reading stock and junior securities to the tune of over $7,000,000 annually. The iron trade of Eastern Pennsylvania and many local industries are deeply interested in this struggle. They are heavily handicapped to-day and are entitled to having their burdens lightened rather than to have an additional crushing load put upon them. Fortunately there seems little chance that Mr. Gowen, even if he does return to his old post, will be able to carry out his programme.

The anthracite coal trade has the misfortune to be controlled more than any other in this country by the position which a few men high in its councils happen to occupy on the one or the other side of the market in Wall street. Accordingly, during the past few months a good deal of fuss has been made over the better demand incidental to the approach of the winter season, and a number of advances have been decreed—on paper. While the inquiry and prices have undoubtedly improved, the eagerness to work up stock quotations has much exaggerated both, and the coal companies are now in danger of finding that they must choose one of two alternatives. They must either confess that they have tried to deceive the public, or they must share their better fortunes with their men. The latter somewhat defiantly claim that they are in a better position than they have been in for years. The system of restriction prevailing until this year by concerted stoppage of whole weeks or parts of a week was one full of hardship to the miners. It meant that a much larger working population was retained than was really necessary if work were steady. Thus, if, for instance, the collieries were closed down one day out of three during the year, it would take 33 per cent. more men to mine the coal which could be produced by a smaller number working 300 days in the year. In the beginning of 1885 this system of restriction, which had such unfortunate results for the men, was abandoned, and the allotment plan substituted, the result being the closing down of a number of unprofitable collieries, which forced an exodus of a part of the working force. Those who remained behind had steadier employment. To them it was a blessing, but it seems to have revived in them a little of that spirit which once made the anthracite regions the scene of the most desperate labor struggles, accompanied by the outrages of the Molly Maguires. The companies, or at least some of them, are fostering this spirit of discontent by highly-colored statements concerning their prosperity—a game which, it will be seen, has its dangers.

The Argentine Republic is forging ahead under the stimulus of English capital and enterprise. The various schemes of improvement now in course of execution comprise the construction of a grand harbor at the principal seaport, Buenos Ayres, with railways radiating toward the Andes and Pacific in such a manner as to connect the principal cities of the interior to and tap Bolivia, which lost her seaports as a consequence of the war in Chili. The entire expenditure contemplated is nearly $50,000,000, exclusive of $10,000,000 for the harbor at Buenos Ayres. The contractor, Louis Gonzales, ex-Secretary of State, represents an English syndicate whose ultimate object appears to be the development of grain culture and cattle grazing on an enormous scale. One effect will be to divert from the Pacific Coast a large trade which now is transported coastwise through the Straits of Magellan. The wealth of the Bolivian mines now inaccessible will be readily transported to the sea. It is surmised that in supplying railway materials and merchandise required by laborers the United States can compete successfully with any country in Europe, and perhaps materially enlarge our permanent commerce.

Steel Castings.

To the Editor of The Iron Age.—DEAR SIR: In your issue of October 1 is published, with the proceedings of the meeting of the American Institute of Mining Engineers, at Halifax, an article on "Steel Castings," by Mr. A. V. Abbott, of the Fairbanks Scale Co., of New York, that does us injustice as compared with other manufacturers of steel castings. Mr. Abbott in his tables gives the title Solid Steel Casting Co., Alliance, Ohio, and then goes on to give the various results, which are not very flattering to the above company's work, especially in what he says as to the material in his remarks. Now, let us say, Mr. Abbott never got these test pieces or any other pieces from us, and the pieces tested were not of our make of steel at all. His mistake most likely came from confounding with us another company of nearly similar name established in New York, and had he left out the words Alliance, Ohio, we would have had no reason to complain, as our name is the Solid Steel Co., not the Solid Steel Casting Co. We have had some correspondence with Mr. Abbott, and had hoped that he would correct his mistake, but as he has not done so we are obliged to ask you to insert this in your paper, and thus as far as possible remove the false impression made in that article. The Standard Steel Co., of Thurlow, Pa., are sending around a circular giving these tests so favorable to their castings, and as they have not used the words Alliance, Ohio, we would have no reason to complain of them doing so were it not that the article in your paper would lead the public generally to think we were the works referred to.

Yours respectfully, THE SOLID STEEL CO.

All the police and fire-alarm telegraphs in this city, comprising a six-conductor cable and 175 wires, were laid underground and communication established in 36 hours after the work began. The result was pronounced in every way a success. A trench 2 feet deep having been dug, boxes or conduits of rough spruce were laid in the bottom to contain the cables. The cable was shipped from Pittsburgh on reels or drums carrying from 1000 to 2000 feet; these were mounted, as required, on reel carriages, and then drawn along the trench, the cable being paid off and evenly into the conduit as the mounted reel moved along. When all the cables required for each route were thus laid into the conduit the latter was filled with roofing pitch as an additional safeguard against mechanical injury from future excavations; after this a 1½ inch cover was fastened on the boxes, the trench refilled with earth and repaved. Connection between the cable ends and the air lines is made in a special cable box placed on the poles at which the cable routes terminate, a permanent lightning arrestor being interposed between the air line and the cable wires.

WASHINGTON NEWS.

(*From Our Regular Correspondent.*)

WASHINGTON, D. C., November 17, 1885.

The replies of the manufacturers and others to the circular of tariff inquiry of the Secretary of the Treasury now aggregate 300. A very large proportion, however, come from importers who do not favor a change from ad valorem to specific duties. Their line of argument is very specious. An incredulous person might say that their opposition grows out of the fact that the change would cut off the opportunities for undervaluation, by means of which foreign manufactures are thrown upon the American market to the great injury of home trade.

Some surprise is expressed at the Treasury Department at the delay on the part of the American Iron and Steel Association in making reports. The department was given to understand that this association was the representative organization in this branch of metallurgical industry, and, therefore, took special pains to give it every attention in the line of the proposed inquiry. The other iron associations have sent in their replies and have also given assent to printing them for transmission to Congress. Private information has been received here indicating that the cause of the delay on the part of the American Iron and Steel Association is some difficulty in reconciling the conflicting interests of the iron and steel producers and the demands on the parts of some for free raw materials, so far as iron ore is concerned. The pro-British party in Congress are waiting for the recognition of such a claim on the part of iron manufacturers in other respects for protection.

FREE RAW MATERIALS.

It is noticeable that Mr. Morrison, who produces nothing, backed by Mr. A. S. Hewitt, who is a large manufacturer, entertain the same views as to free raw materials. It is admitted here that if the same views receive any favorable recognition from a representative body it will be an entering wedge for the free traders which they will force into the protective system in hopes of splitting it in two.

APPROACH OF CONGRESS.

The approach of the first session of the Forty-ninth Congress is making itself evident in the number of Senators and Representatives who are in the city making their arrangements for the winter. There is now no doubt of the re-election of Carlisle, which means the reappointment of Morrison as chairman of the Committee on Ways and Means, and a free trade committee. An expression of the views of 160 Members of Congress—91 Republicans and 59 Democrats—on the following propositions have been received and summarized as follows:

1. Would you favor an amendment to the rules of the House providing that general appropriation bills, except the Legislative, Sundry Civil and Deficiency bills, shall be prepared and controlled hereafter by the appropriate standing committees on the several branches of public service? The responses stood, Republicans, yes, 48; with qualifications, 12; non-committal, 22; no, 9. Democrats, yes, 47; with qualifications, 5; non-committal, 3; no, 4.

2. Do you favor any change in the laws governing silver coinage and silver certificates, and, if so, what modification would you regard as desirable? Republicans, yes, 60; no, 16; non-committal, 15. Democrats, yes, 4; no, 49; non-committal, 6.

3. To what extent, in your opinion, would a revision of the tariff and internal revenue laws be desirable at the next session? In favor of agitation, Republicans, yes, 4; no, 75; non-committal, 12. Democrats, yes, 53; no, 3; non-committal, 3.

On the question of the Speakership: Of the 59 Democrats 57 are for Carlisle, one for Randall, and one non-committal. Of the 91 Republicans 30 are for Hiscock, of New York; 27 non-commital; 23 for Reed, of Maine, and 11 for ex-Governor Long, of Massachusetts.

This may be taken as about a fair proportion of the entire membership of the House on those questions.

THE PRESIDENT'S MESSAGE.

The President expects to settle down to the writing of his first annual message to Congress early next week. He has the raw material on hand, but has not settled down to the task of working it into shape.

A cable from Glasgow to Messrs. G. W. Stetson & Co., of this city, announces the death there yesterday morning of Mr. Robert Donaldson, of the old firm of James Watson & Co. Mr. Donaldson was one of the largest operators in metals of various kinds in Great Britain, and has always exerted a great influence in the warrant and metal markets on the other side. He was here last spring on a visit to the Dayton Coal and Iron Co.'s property, in Dayton, Tenn., in which he was interested with other English and Scotch capitalists, among them Sir Titus Salt, Saltaire, England.

Messrs L. W. Morris & Son, of 18 and 20 Broadway, have been appointed forwarding agents and representatives by the council of the General International Exhibition of Navigation, Traveling, Commerce and Manufacture, at Liverpool. This exhibition is to be held from May, 1886, to October of the same year.

On October 10 last Lombard, Ayres & Co. shut down a 65-horse power Westinghouse engine after a practically continuous run of 11 months. The engine was started in November, 1884, and after a run of three months was stopped to make a trifling repair; starting again almost immediately, they ran continuously for eight months more, with two stops in that time long enough to lace a belt. The engine was finally shut down for the purpose of removing it to another building, and an examination revealed that no repairs were necessary. It is belted direct to a fan blower.

American Society of Mechanical Engineers.

BOSTON MEETING.

For the first time in the history of the American Society of Mechanical Engineers the annual meeting has been held elsewhere than in the City of New York. Great things were expected of the Boston meeting, and all expectations, we think, were fully realized, every circumstance connected with it having added to its pleasant and profitable features and tended to make it a memorable gathering. The opening session was held on

Tuesday, November 10,

at the Hotel Brunswick, at 8 p. m. A large number of members and many of the scientific residents of Boston were present. After half an hour of pleasant social intercourse Mr. C. J. H. Woodbury, in the temporary absence of Mr. E. D. Leavitt, Jr., chairman of the Local Committee, delivered a brief opening speech, adding an account of the four days' work before the society in Boston. He then introduced Mayor Hugh O'Brien, of the city of Boston, who was warmly received, and who briefly but heartily welcomed the members and guests of the society. Gen. Francis H. Walker, president of the Massachussetts Institute of Technology, next called upon, tendered the society the use of the buildings of the Institute, and expressed the great pleasure which the corporation and the faculty of the Institute felt in receiving within their walls so distinguished a body of engineers. Mr. Edward Atkinson repeated the welcomes already given, and dwelt upon the vast importance of engineering science, its influence in disposing of perplexing problems, and the results which had been achieved by its aid. At this point a letter from Governor Robinson was read, in which he regretted his inability to be present. President J. F. Holloway then briefly and happily responded to the various addresses of welcome, and finally delivered the annual presidential address, in which he dwelt upon the progress of engineering science, the usefulness of organized association of mechanical engineers, and allied matters of interest and importance. The meeting was then adjourned, and a lunch served in the adjoining rooms formed the concluding feature of the evening.

Wednesday, November 11.

The morning session, called to order at 9.30, was opened by the presentation of the report of the tellers announcing the names of the newly-elected members and associates. This was followed by the report of the Finance Committee, which showed that, owing to several circumstances, principally the large expenditure incurred by the publication of the last volume of "Transactions," the financial condition of the society was anything but encouraging. Mr. Henry R. Towne and also President Holloway, referring to this point, suggested that increased membership would not only offer some relief, but would bring to the Society many men of prominence in the engineering profession. The report of the Library Committee showed that encouraging progress was being made, the subscriptions during the past year having been somewhat over $700. Books and magazines of engineering value had also been received.

The ballot for officers resulted as follows:

President.—Coleman Sellers, Philadelphia.

Vice-Presidents.—Olin Landreth, Nashville, Tenn.; Horace See, Philadelphia, Pa.; Chas. H. Loring, U. S. N., Washington, D. C.; Allan Stirling, New York City.

Managers.—Hamilton A. Hill, Boston, Mass; William Kent, New York City; Samuel T. Wellman, Cleveland, Ohio.

Treasurer.—Wm. H. Wiley, New York.

The first paper of the session was that of Prof. J. E. Sweet, on

"THE UNEXPECTED WHICH OFTEN HAPPENS,"

in which he stated that it was not so much the unexplainable as the unexpected which attracted our attention, excited our astonishment or disturbed our mental equilibrium. The man who devotes his life to experimenting with practical mechanics is sure to meet with the unexpected, or else to be too wise for his generation. Some do not care to admit that they were ever caught with the unexpected, but Professor Sweet exposed a few of the many things that came upon him unexpectedly, and he related them for the benefit of his hearers and with the hope that others would explain their experience in turn. The unexpected occurrences which Professor Sweet took note of were various and covered many branches of engineering. Beginning with the phenomenon known to plumbers as the air-trap, and so inexplicable to the ordinary intelligence, he presented a number of apparent paradoxes in steam engineering, physics and metallurgy, stating his facts without any attempt at explanation—in fact, as he acknowledged, he would find it impossible to unravel the mystery in every instance. We publish Professor Sweet's paper in full in another column, and need, consequently, not refer to it further in this report.

Mr. Henry R. Towne, of Stamford, Conn., in adopting Professor Sweet's suggestion and speaking of the unexpected in his experience, drew attention to some difficulties which he encountered in hardening small and thin steel castings. The thin parts were $\frac{1}{8}$ inch thick, and he found that when treated in the ordinary way with prussiate of potash no perceptible effect was produced, the metal giving way readily before the file. Cyanide of potassium was found to yield better results, but the cost was prohibitory. Finally, on breaking the castings, it was discovered that perfect hardening had taken place under the skin, and that thus the outside only was soft.

Mr. George M. Bond, of the Pratt & Whitney Co., of Hartford, stated that he had experienced similar results in tempering taps. These often appeared soft, when really the outside only was decarbonized by over-annealing.

Mr. W. F. Durfee, of Bridgeport, Conn., cited a circumstance of his own experience with a safety-valve, concerning which a letter, with illustrations, from him appeared in our issue of August 6. We would here briefly remark, however, that this valve was attached to a boiler with three gauge-cocks only, and without dial pressure-gauge or water-glass. As the boiler was to be used only a short time Mr. Durfee did not think it necessary to furnish it with the two last-named fixtures. The lever was graduated to 120 pounds. On a certain occasion it was found that the valve weight was at the 120-pound notch, and there was but a suggestion of steam escaping. Unable to determine the difficulty without careful inspection Mr. Durfee had the fire drawn, and after cooling down an investigation was made. The shell of the valve, it appears, was of cast iron bored out to receive a cylindrical gun-metal bushing which was forced into its place and held there simply by friction. On the upper end of this bushing the seat for the valve was formed. As long as the bushing remained immovable the steam pressure acted on a circular area of the lower surface of the valve, having a diameter equal to that of the interior of the bushing, but as soon as the repeated expansions and contractions incident to use and years had loosened the bushing the circular area upon which the steam acted had a diameter equal to the exterior of the bushing, which, with the valve resting upon it, was then free to move upward as far as the lever would permit, acting simply as a piston valve—or, rather, piston—with no outlet for the steam save that due to the trifling leakage arising from its imperfect fit in the shell. The area of the last-named circle was a little more than double that of the first, and this fact explained the remarkable performance of the valve in a most satisfactory and simple manner.

Professor Rogers referred to a clock which stopped running without any apparent cause, and in which it was found on examination that one of the wheels had no "end shake," causing it to bind.

Mr. Hammond, referring to the difficulties experienced in hardening steel, remarked that the film of steam formed when the piece to be hardened is dipped into water very probably exercised an important influence on the result. This film, being of varying thickness, would naturally give rise to varying effects. In hardening thick steel plates he found running water to be much to be preferred. Mr. Hammond also spoke of the difficulty of obtaining sound steel castings, and some methods which he had found to yield good results.

Mr. Oberlin Smith, of Bridgeton, N. J., in contributing to the list of unexpected things which often happen, remarked that on one occasion he made a metal cup about $\frac{1}{16}$ inch deep and from 2 to 3 inches in diameter, into which he wanted water to leak through a small hole in the bottom by partially submerging the cup. With a hole $\frac{1}{64}$ inch diameter he found that no admission of water could be effected unless the cup was submerged to a depth of more than 1 inch. Successive diameters of hole gave but little better results. By making the hole slightly larger at the top, however, the water passed through readily. Thus, with a hole tapering from $\frac{1}{32}$ inch in diameter at the bottom to $\frac{1}{16}$ inch in diameter at the top, no great difficulty was experienced.

The second paper of the session was by Mr. Samuel Webber, of Lawrence, Mass., on

THE FRICTIONAL RESISTANCE OF SHAFTING IN ENGINEERING ESTABLISHMENTS.

Mr. Webber stated that a paper on the above subject, recently presented to the society, seemed to to give an impression, with regard to the amount of power actually consumed in overcoming said resistance, which differed widely from the results of his experiments. The reason for this discrepancy was to be found in the assumption made in the previous paper that indicator cards, taken with all the machine belts running on the loose pulleys of the machines, were a correct representation of the power absorbed by the shafting. This is to be denied *in toto*, as the loose pulley are only a part of the machine placed on it for the convenience of the operator, to avoid the delay and annoyance and possible danger of throwing the belt off and on the driving pulley on the shaft every time that the machine is to be stopped and started again, and is in no sense a part of the shafting. When the machine is in operation the loose pulley is not in use, but the power is taken from the shaft to the machine by the machine belt, which latter is merely an accessory to the machine itself, which cannot be operated without it, while the shafting can be. This method of taking indicator cards to ascertain the power consumed by the shafting, with the belts running on the loose pulleys, has been the usual and common one, but it is none the less erroneous, as it only arises from the unwillingness of the mill owners or operatives to take the time and trouble necessary to throw the machine belts off for a few moments entirely while the indicator cards are being taken. This amount of power consumed by the machine belts running on the loose pulleys will average in a cotton mill fully 10 per cent., varying from 5 or 6 per cent. in the spinning rooms to from 18 to 20 per cent. in the weaving room. This 10 per cent. is in this manner charged to the shafting, making an average, as given in the paper referred to, of 25.9 per cent. in a large number of mills for shafting and engine, which should not be over 16 per cent. in a properly-shafted mill, and which is even much less than that in mills of modern construction if the machine belts are thrown off before taking the indicator cards, a method of getting at the matter which has been accomplished by taking a Saturday afternoon for the purpose. This 16 per cent. should be divided as follows: Engine, 6 per cent.; shafting and belting, 10 per cent., including in the latter all counter-belts and everything except the small belts actually driving the machines, to which their power, as has been said, should be charged, as they can neither be operated nor their power weighed without them.

A number of years since Mr. Webber had occasion carefully to weigh and determine the power consumed in a large cotton mill which had just been entirely rebuilt and fitted with new shafting by one of the most judicious engineers in New England, the late E. A. Straw, of Manchester, N. H., and, although the shafting was not of quite so small a diameter or run at so high a

speed as has since been often adopted, it was very well arranged and would serve as at least a fair example of good average dimensions. The summary of the total power required by the machinery was 744.22 horse-power, and, in making up the account of the whole, 10 per cent. was allowed for the shafting, but subsequently the latter was calculated as a whole from weighings which Mr. Webber had made of a large part of it, assuming that which he had not weighed to require the same power in proportion to its diameter and velocity. These calculations gave a total of about 62 horse-power, or only 8.3 per cent., instead of 10 per cent., and have been fully confirmed by many subsequent experiments. The spinning-room in this mill contained 198 throstle frames of 128 spindles each, requiring at least 1.5 horse-power each, or 297 horse-power in all, and 12 filling winders and 13 spoolers, requiring also 21.75 horse-power, or a total of 318.75 horse power. These machines were placed in 10 parallel rows, lengthwise of the mill, and were driven by two lines of main shafting, each driving a set of machines direct, and two other sets to either side by counter-shafts, each of which drove two machines. This made 24 short counters driven from each shaft.

The main shafts were each as follows: One length of 10 feet 4 inches, 4½ inches diameter, receiving the main belt, then divided equally to the right and left in lengths of 16 feet each; 80 feet of 2⅞ inches diameter, 32 feet of 2⅝ inches, 48 feet of 2¾ inches, and 32 feet of 2½ inches—in all, 202 feet 4 inches each. The counter-shafts were each 8 feet 6 inches long and 2⅛ inches diameter, and the velocity of the whole was 216 revolutions per minute. The required power to carry this shafting by dynanometer measurement was, for each main line, 1587 horse-power, and the coefficient of friction was only 0.0334. For each set of four counters, with their counter-belts, the power was 0.357 horse-power, and the coefficient of friction was 0.0413. The total power, therefore, for each system was, main line.. 1.587 horse-power
Six set counters, four each at 0.35..... 2 142 horse power
Or..... 3.729 horse-power
which, multiplied by 2, gives..... 7.458 horse-power as the total for the room, or only 2.34 per cent. of the power required for the machinery. Now this is the extreme light point, as the spinning-room requires the least shafting and uses the most power in the machinery of any room in a cotton mill. In a weaving-room for print cloths the power for the shafting is about 20 per cent. of that required for the looms, or about the same as that absorbed by the machine belts running on the loose pulleys. Having positively settled this fact in this mill, weighings were afterward made in other mills of a sufficient portion of the shafting to enable Mr. Webber very closely to compute the total, which he only once or twice found to exceed 10 per cent., which basis he therefore took as a safe one to use in computations of the power required to operate a cotton mill.

As an illustration of the closeness of an estimate made on this basis, Mr. Webber remarked that he was called upon some years since to decide upon the size of turbine required to replace an old-fashioned breast-wheel in a mill where every inch of water-power was of value. Dynamometer weighings gave as the power required for the machinery..... 214.24 horse-power
Adding 10 per cent for the shafting, or..... 21.42 horse-power
gave a total of..... 235.66 horse-power as the horse-power required. One of the sizes of the turbine adopted was guaranteed to give 240 horse-power under the available head of 11 feet, and, as this wheel had been very thoroughly tested by both Mr. Mills and Mr. Francis, Mr. Webber advised the millowners to put in this size of wheel, though apparently a very close fit for the required power, for, as above said, every inch of water was of consequence. The wheel was put in, and to the great delight of the owners, when the water was let on and the machinery put in full operation, there was still a part of the last tooth in the gate-rack of eight teeth left unhoisted. A similar operation in another mill a couple of years later with the same turbine gave equally satisfactory results.

At both of the last two mills spoken of, the shafting was old and in excess of the amount which would be used to day for the same machinery. Soon after making the first one of them Mr. Webber weighed the power used by one of the new mills at Fall River. His result, however, did not agree with cards from the indicator. The cards gave a total power of 470 57 horse-power; Mr. Webber's weighings of the machinery only gave 408.94 horse power, to which he had added 10 per cent. for shafting, making a total of 449 83 horse-power. This he then increased to 15 per cent for "engine and shafting," making an addition of 20.45 horse-power more, and giving a total of 469 91 horse-power, or a variation of less than 1 horse-power in the two results, with the estimate of 15 per cent. for the engine and shafting Indicator cards taken at one of the later mills in Fall River, when the machine belts were all thrown off from the driving pulleys on a Saturday afternoon, when it could be conveniently done, gave only between 12 and 13 per cent of the total for engine and shafting, and Mr. Webber is fully convinced, by these and other experiments, that 15 per cent. for "engine and shafting," or 10 per cent. for "shafting only," is an ample allowance to be made for a cotton mill in good running order as they are now constructed.

As regards undersized shafting and over tight belts, Mr. Webber stated that far more friction in the bearings will be caused by the springing of a flexible shaft than would be due to the necessary excess of diameter to make it sufficiently rigid to resist flexure from the strain of the belts, nor is the substitution of steel for iron any material improvement in this respect. From a series of elaborate experiments made by Mr. Jas. B. Francis, C. E., of Lowell, for the Merrimac Mfg. Co., in 1866, and published by him in the *Journal* of the Franklin Institute for April, 1867, he deduces the fact that while a 2 inch iron shaft, "subject to no transverse strain other than its own weight," would admit of a distance between bearings of 15.46 feet, a steel one would only admit of 15.89 feet, although the diameter necessary to resist torsion need be only 0.855 for steel to 1.0 for iron.

Over 40 years since cast-iron shafts of a cruciform section, on which wooden drums or cylinders were built up, reaching from beam to beam, were still in use, although wrought-iron shafts and cast pulleys were being substituted. The first formula for the diameter of wrought-iron shafts was given by Buchanan in his "Mill Work and Machinery," and was: $D = \sqrt[3]{\frac{100 \times \text{H. P.}}{R}}$

This formula Mr. Francis still retained after the experiments referred to, as a good one for jack-shafts or first movers and for the first length of lines, receiving the pull of the main belts, computing the factor of safety or power of resistance above the breaking strain to be 15 58. For transmitting lines he reduced this coefficient of 100 to 50, and for light counter-shafts supported close to the bearings to 33, and since the introduction of "cold rolled shafting" Mr. Webber found the latter coefficient to answer perfectly for transmitting lines, although he preferred to keep close to the original formula for first movers, to resist the transverse strain without flexure, and when the bearings are from 8 to 10 feet apart, as is the usual condition in cotton and woolen mills, did not advise the use of any shafting much less than 2 inches diameter, unless for the very last length of a line or for such light power as is required for knitting or sewing machines. Even in cases where the beams are 10 feet apart it is well to use an intermediate hanger near the pulley if any amount of power is to be taken of. Mr. Webber stated that he had seen a 2¼-inch shaft, at 250 revolutions per minute, where about 4 horse-power was taken from it midway between beams 10 feet apart, so "buckled" by the strain that he could not bear his hand on it near the pulley, and in other cases found the coefficient of friction doubled in the same manner when testing with the dynamometer. While the above observations apply more particularly to cotton and woolen mills, still the same principle will hold good in all cases; and in the case of machine shops, where the percentage of shafting to the power consumed by the machine tools is much greater, the last counter-shafts, with their loose pulleys, are always sold with and form a part of the machine itself, and the power for these should be charged to the machine and not to the shafting.

In the resulting discussion Mr. Oberlin Smith pointed to an evil specially prevalent in machine shops, viz., slow speeds. The shafting, he claimed, ran about half as fast as it ought to, machine tools generally being made so that the line shafting should run at 100 revolutions per minute. Much more satisfactory results would be obtained with a speed of about 200 revolutions. Wide belts running at slow speeds and tightly stretched necessarily strained the shafting, while high speeds with narrow belts offered greater facilities in shifting, avoided the use of friction clutches, which are often troublesome, and presented many other advantages. The ideal shafting for slow speeds, Mr. Smith said, was hollow, with reduced journals to avoid excessive friction.

Mr. Babcock, of New York, referred to the experiment made at Fall River several years ago with hollow shafting running at high speed and having no pulleys, the shaft being, in fact, one continuous pulley. Particulars relating to this case would, he thought, prove generally interesting. Mr. Babcock directed attention also to the evil results of tight belts in increasing friction.

Mr. Oberlin Smith said that the continuous-drum plan referred to was good if properly carried out, but as used in the case mentioned by Mr. Babcock the drum was too heavy. It was made of cast iron; if, however, steel tubes were used for the purpose, the result would be satisfactory, the shafting produced being neat, cheap and giving infinitely less trouble than other forms. Mr Smith further advocated the introduction of standard speeds for belts and counter-shafts.

Mr. Towne stated that at the Wheeler & Wilson sewing-machine factory, at Bridgeport, Conn., hollow cast-iron shafting, 12 inches in diameter, was used, constituting a continuous-drum system, as mentioned by Mr. Babcock. This form of shafting, however, is there used only where the machinery is almost uniform, being engaged upon only one kind of work, and thus requiring a uniform speed. With a miscellaneous assortment of tools this shafting would not be convenient. As regards the friction of shafting, Mr. Towne remarked that the consumption of power in driving shafting with and without work was found to be in the proportion of two to one at the Yale & Towne Works. This large figure was in a measure due to the fact that many mule pulleys were employed, and that in making the determinations the friction of some machines which could not be thrown off was included, such as, for example, blowers The power also was sent to distant points, between which and the main source of power no machinery was placed. Taking all these points into consideration, the proportion which he gave would occasion less surprise.

After some further remarks by Mr. Webber, the third paper, on

A NEW FORM OF STEAM CALORIMETER,

by Mr. George H. Barrus, was read. Mr. Barrus stated that the calorimeters ordinarily used for measuring the dryness of steam operate in an indirect manner. They first determine how much heat is contained in the sample tested. The condition of the steam with respect to dryness is then shown by comparison of the result with the quantity of heat given by the authorities for dry saturated steam. The sample contains moisture in proportion as the result is less than the authorized standard. It contains what is termed "superheat" in proportion as the result is greater than the standard. Suppose the steam has a pressure of 80 pounds per square inch above the atmosphere. The total heat given in the tables for this pressure is 1212.6 B. t. u. above 0 F. If the calorimeter test yields, for example, 1190 B. t. u., it falls short of the standard 22.6 B. t. u, which is an indication that the steam contains $\frac{22.6}{885\ 7} = 2.5$ per cent. of moisture. If the test yields, say, 1225 B. t. u., it gives an excess over the standard of 12..4 B. t. u., which is an indication that the steam is superheated $\frac{12.4}{0.475} =$ 26.1 degrees.

Calorimeters which work on this principle do not give accurate indications of the amount of moisture in steam unless thermometers and scales are employed which are sensitive and which register minute changes, and unless extreme care is used in the manipulation of the apparatus. In the case of the barrel calorimeter, the one commonly used, supposing the range of temperature to be 50° F. and the weight of steam used for a test 20 pounds, an error of ½° in the observations of the thermometers or an error of ½ pound in the observations of the weight of water in the barrel causes an error of 1 per cent in the result. A larger error than this might ensue if the observations of each extreme were erroneous and all the errors acted in the same final direction. Unusually close work is more important than would first appear, for the reason that the moisture in steam of ordinary dryness does not often exceed 3 per cent., and a small error becomes large by comparison. Calorimeters of the continuous type are more accurate in this respect, for they deal with larger quantities of steam and water and a greater number of obs rvations for a given test. But they require equally careful manipulation.

The new form of calorimeter described by Mr. Barrus so far reduces the errors referred to that they become almost inappreciable, and it greatly simplifies the operation of making an accurate test. In order to use it, it is simply necessary to observe thermometers which show many degrees change of temperature for a change of 1 per cent. of moisture. It is intended to be used only for testing moist steam. Unlike the calorimeters referred to, the new apparatus operates directly upon the moisture contained in the sample of steam tested. It evaporates the moisture, and determines its amount by measuring the amount of heat required for this purpose. The evaporating agent is a current of superheated steam, and it is the superheat of that steam which is utilized to do the work. The determination of the amount of superheat required constitutes the immediate object in view, and this is attained by observing the temperature of the superheated steam before and after its use. When the quantity of superheated steam equals that of the sample tested, the evaporation of 1 per cent. of moisture reduces the temperature approximately 18.7° F.* In proportion, then, as the fall of temperature is greater or less than this number of degrees, the amount of moisture sought for is greater or less than 1 per cent.

It is immaterial what the exact quantity of steam is which is tested, so long as the relation borne to the current of superheated steam remains constant. Weighing is therefore dispensed with altogether, and the desired relation between the quantities is maintained by causing each current of steam to pass through an orifice of fixed size. To obtain equal quantities, which is the relation most to be desired, the two orifices are made of practically the same size and the steam is admitted upon them with a pressure common to both. As regards the matter of the error to which the new calorimeter is liable, a difference in temperature of approximately 18.7° appears when a change of 1 per cent. occurs in the amount of moisture. If an error, therefore, of 18.7° was made in observing the required difference of temperature, it would affect the result only 1 per cent. In the case of the barrel calorimeter an error of 18.7° would affect the result 37.4 per cent.

Referring to the paper, Mr. Babcock said that there was an apparent necessity of something accurate for the purpose of determining moisture in steam. He remarked that at the Electrical Exhibition in Philadelphia the calorimeter results were all thrown out and the proportions guessed at, the guesses apparently being more correct than the measurements. He spoke also of the difficulty of obtaining two orifices of exactly the same sizes. He remarked, further, that when the instrument was set for one particular proportion of moisture any variation would throw it out of adjustment.

Professor Lanza offered some suggestions, and spoke of an arrangement which had been adopted at the Massachusetts Institute of Technology.

Professor Thurston remarked that Mr. Hirn determined the quality of steam as early as 1865, but that up to 1871 few experiments had been generally made. The quality of steam furnished by boilers up to that date was practically unknown. In that year Professor Thurston organized a method of determination for a number of different boilers at the American Institute fair. Tubes were obtained from Mr. Root, and from these a condenser was constructed into which the steam from the boilers was delivered. A short time after attempts were made with the ordinary form of barrel calorimeter. Difficulties were encountered so far as accurate thermometer readings and uniform distribution of heat were concerned. Professor Thurston then dwelt at some length upon the calorimeters designed by Hoadley, Van Buren and others.

The session was then adjourned.

(To be continued.)

* This is the exact quantity for 80 pounds pressure. For other pressures the quantity is obtained by dividing the latent heat by 47.5.

Fig. 1.—View of Furnace with Supplementary Perforated Arch.

Fig. 2.—Perspective View.

THE STEVENS FURNACE, BUILT BY THE STEVENS FURNACE CO., BOSTON, MASS.

The Stevens Furnace.

In an article in a recent issue by Mr. F. E. Galloupe allusion was made to the process of burning coal known as "secondary combustion." We are enabled this week to show the Stevens Furnace, designed to operate upon this principle. Its purpose is for use under any steam boiler, or for heating and smelting operations, and to furnish an increased boiler-power, as well as economy, with the types of boilers in common use. In cities where the burning of anthracite coal has been heretofore required, on account of its freedom from smoke, bituminous coals of all grades, it is claimed, can be substituted with this furnace without the production of smoke, and a saving in the cost of fuel thus made. It is designed to supply the exact quantity of air required to chemically unite with the carbon and hydrocarbon gases of the coal, the supply being capable of regulation, and hence an increase of economy is secured over the ordinary furnace. The bridge wall is built up hollow upon a cast-iron plate containing a sliding damper-valve. Just above the body of coal upon the grate are small tuyeres or passages for the distribution of the air in fine streams equally over the body of incandescent coal upon the grate, and also to the combustion chamber beyond the bridge wall. To furnish and control the air supply an ordinary fan blower is employed, forcing the air through a pipe into the ash-pit, the amount of blast being regulated by a gate in the pipe. The ash-pit and fire-doors are kept closed while running, and there is hence a pressure of air at all times in the ash-pit, part of which air is admitted over the fire by opening the sliding damper, admitting it from the ash-pit within and through the bridge wall.

A superheater, shown upon the top of the bridge wall, has a small quantity of steam from the boiler passed through it in a zigzag course, by means of a valve and ½-inch pipe, not shown. This steam, being heated in the superheater to about 800° F., passes down through the vertical pipe shown at the left of the furnace in the illustrations, and through a ¼-inch nozzle to the ash-pit, where it mingles with the air from the blower. A perforated arch is shown over the furnace in Fig. 1, together with a perforated or cellular wall a short distance back of the bridge wall. This arch is sometimes found necessary with lignites or very soft coals liberating large quantities of hydrocarbon gases, in order to sufficiently raise the temperature of the gases of combustion to burn them perfectly, since these gases, should they strike directly upon the comparatively cool boiler shell before being consumed, would be at once cooled below the temperature of ignition and would produce smoke, which is only another name for unconsumed carbon. Ordinarily, however, the arch is not needed, since the gases are maintained at a sufficiently high temperature by means of the superheated steam, combustion chamber and perforated wall, which becomes highly heated, and through which all the gases must pass on their way to the chimney.

Neither the air supply alone nor the use of a common steam jet would increase the economy materially; but by the use of superheated steam in this way a gas is formed in the first combustion or distillation of the coal in the furnace, from 60 to 70 per cent. of which is combustible, while of the ordinary furnace gases, the oxygen of which is diluted by the mixture of four-fifths nitrogen from the air, but 33 per cent. is combustible. The gases formed by this process are burned in turn with additional oxygen and heated air before or as they pass beyond the bridge wall, and the combustion is completed as a secondary process in the combustion chamber immediately beyond it.

The facts, as determined by careful tests of boilers set with this furnace, seem to indicate a large increase in the amount of heat made available by the consumption of coal upon this principle, and are thus of importance to manufacturers and steam users who wish a more perfect and less wasteful appliance than the average steam boiler furnace. The furnace above described is being introduced by the Stevens Furnace Co., 30 Kilby street, Boston, Mass.

THE
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AND
Index to Advertisements.

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A large quantity of manufactured Saws of various sizes, including Circular, Cross-cut, One-man, Panel, Pruning, Hand, Rip, Ice, Kitchen, &c. Also Saws of Lightning and other patented make, and Handles; Files of different kinds and sizes; Saw Sets, Ice Chisels, Cabinet Scrapers, Billet Webs, Turning Webs, Felloe Webs, &c.

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Also all the right, title and interest of the said E. M. Boynton Saw and File Co. in and to the following Letters Patent of the United States:

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Are You Looking for PATENTED SPECIALTIES To Manufacture?

If so, write us, giving full particulars of your wants, and we can undoubtedly save you *time and money*. We have a large number of Patents (both for the United States and Canada) registered in our office. Manufacturers can make favorable arrangements with us to secure, on a basis of royalty or by purchase, any Patent we have. Address

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HARDWARE TRADE.

Acknowledged by ALL the best work of the kind ever published. Price by mail ONE DOLLAR.
Address **E. B. LEIGH,**
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An old-established Stove, Hardware and House-Furnishing Goods business on one of the leading avenues in New York City. Reason for selling, owner retiring from business. For particulars, address ACME NOVELTY CO.,
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Apply to
DAN'L W. RICHARDS & CO.,
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FOR SALE—A complete factory with Steam Power for the manufacture of Saddlery Hardware, Buckles and Buckle Tongues.
Address WM. BLUM,
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MANUFACTURERS and Importers of Light or Heavy Hardware, Cutlery, Brass Goods, House-furnishing Goods and Specialties who want to be represented before the first-class trade of the South and Southwest at a moderate cost, by a competent and experienced salesman, will consult their interest in communicating with the undersigned before completing arrangements for 1886. A limited number of lines. Best business references. Address "COMBINATION," Office of *The Iron Age*, 83 Reade St., New York.

Wanted.

Second-hand Cupola, about 42 in. diameter.
Foundry Ladle, 5-ton capacity.
J. A. EMERICK & CO., Philadelphia.

A Mechanical Draughtsman and Civil Engineer, 27 years old, the last four years employed at a large Steel Works in Pennsylvania, is open for an engagement.
Address "A. B."
Office of *The Iron Age*, 83 Reade St., New York.

WANTED.

A good Salesman who has an acquaintance with the Hardware trade in the West and Northwest.
Address "MIKADO,"
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Special Notices.

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HARDWARE PRICE BOOKS,

LARGE SIZE.

500 Pages, 6 x 10½ inches. Revised and improved.

PERFECTION ATTAINED.

Alphabetical Arrangement. Leather Tab Index. Flexible Leather. Rounded Corners.

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TO LEASE

OR

FOR SALE.

CUT NAIL FACTORY, 34 Machines can be started in 30 days. Address

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Under Royalty for Development and Mining, 300-acre tract *Red Hematite Ore.* Vein opened, 12 feet thick. Ore in large quantity and very superior quality. METALLIC IRON, 61.5; PHOS., .07; SULP. .05. Six miles from Ches. and Ohio R. R., West Virginia. Within reach of three of the largest blast furnaces in the State. Full, exact report, made by an Iron Mining Expert, may be consulted in this office over examiner's signature, and guaranteed by owners and the here undersigned; or abstract Report will be mailed. Call or correspondence invited. Southern investment in all industrial lines.

CLARENCE GORDON,
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For Sale.

CHEAP. SECOND-HAND. GOOD CONDITION.

PLANER, 18 in. x 20 in. x 3½ ft..... $125.
HORIZONTAL BORING MILL, 49 in. swing, 58 in. between centers..... $420.

EDWIN HARRINGTON, SON & CO.
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Rolling Mill Machinery FOR SALE.

One 8 inch Guide Mill.
One Horizontal Engine, 20 in. x 36 in., with 6-ton Fly-Wheel.
One Muck and Bar Mill Engine, 20 in. x 36 in., with 14-ton Fly-Wheel.
All in good order and for sale cheap by
HIRAM WOODS & SON,
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FOR SALE.

Large lot second-hand Iron Tanks, from 5000 gals. down, all sizes and shapes.
One Lathe, nearly new, 26 in. swing, 16 ft. bed.
Large lot new Mule Shoes.
Large new 100 gal. Oil Tanks.
30 tons Red Brass.
500 tons Wrought Scrap.
BUSSENIUS, CUNLIFFE & CO.,
12th and Washington ave., Philadelphia,
Dealers in Scrap Iron and Old Metals.

FOR SALE.

Foundry and Machine Shop, with Patterns, Lumber Planer and all Machinery in running order; located at Jefferson City, Mo., 10 feet from Mo. P. Railroad, and 60 ft. from Mo. River; Building large two-story brick, 125 by 198 feet. Price, $7500; cash required, $1500; balance $1000 annually; big bargain; worth $25,000 to proper party; must be sold on account of death of owner. No foundry within 65 miles. Address
MRS. SOPHIA FISHER, Jefferson City, Mo.

FOR SALE.

150 to 200 tons, 35 lbs. per yard, and about 250 tons, 40 lbs. per yard, second-hand T-rails in good condition for relaying. E. H. WILSON & CO.,
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Wanted.

A young man of four years' experience in the Hardware business wants to buy a nice, clean stock of Hardware in some good, live Western town, invoicing from $4000 to $5000, or would buy a half interest in a stock invoicing from $8000 to $10,000.
Address "HARDWARE," P. O. Box 267,
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Wanted.

A company to manufacture "THE WILD IRISHMAN" Sulky Plow and Eaton Patent Coulter. For cuts and description, address

E. C. EATON, Patentee,
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WANTED.—Situation as Stock Clerk, Bookkeeper or Traveler in a Hardware and Cutlery House; has for 13 years been connected with a well known English Cutlery manufacturing company in their New York agency, and have occupied the above positions; thoroughly conversant with the Cutlery Trade and has an extensive acquaintance in the Southern and Southwestern States. Age 36. Can produce excellent references. Address "X. L.," care of F. B. Gurney, 95 Chambers St., New York.

WANTED.—With an experience of fifteen years in Hardware, both Wholesale and Retail, I desire to make an engagement either with Wholesale House or a position as buyer or manager of large retail business. Can furnish best references. Address "S.,"
Office of *The Iron Age*, 83 Reade St., New York.

SEVERAL second-hand Locomotive Boilers for sale cheap. E. H. WILSON & CO.,
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Special Notices.

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1 Engine Lathe, 92-in. swing, 20-ft. bed, with Back Face Plate for Pit work.
1 7-ft. swing Engine Lathe, 10 ft. bet. centers.
1 Engine Lathe, 7-ft. swing, 30 ft. bet. centers.
1 " 60-in. swing, 25 ft. bet. centers.
1 " 48 in. swing, 24 ft. bed. Cheap.
1 " 33 " 10½ " Pond.
1 " 21 " 12 "
1 " 19 " 7 " Whitcomb.
1 " 18 " 7 " Goulds.
1 " 12 " 5 " Gould
1 Lathe, 18 in. x 8 ft. Jones & Lamson.
1 " 18 in. x 7 ft. Old style. Very cheap.
1 Gap Lathe, 24 in swing, 20 ft. bed. New.
1 Iron Planer, planes 8 ft. x 8 ft. x 16 ft. New.
1 " 42 x 42 in. x 12 ft. New Haven.
1 " 32 x 32 in. x 9 ft. New Haven.
1 " 30 x 30 in. x 8 ft. Bigelow.
1 " 24 x 24 in. x 5 ft. New Haven.
1 " 20 x 20 in. x 4 ft. Bishop.
1 Lincoln Milling Machine.
1 36-in. " Old style. Cheap.
2 15-in. Drills, wheel feed. New.
5 12-in. Upright Lever Drills.
4 Blacksmith Post Drills.
1 2-Spindle Drill. Fine. New.
1 12-in. swing, 4-ft. bed, Hand Lathe.
1 10-in. " Hand Lathe.
1 Upright Boring Mill, 50-in. swing x 24 in. high.
1 Pulley Hub Drilling and Tapping Machine. New.
1 Horizontal Shears. Capacity, 1¼ in square.
1 10-in. Alligator Shears. Heavy.
1 Alligator Shears, 6-in. Jaw. New.
1 Hand Bar-Iron Shears. New.
1 Heavy Punching Press.
1 No. 3 Stiles Punch Press.
1 Boiler Punch, ¾ x ¾, 24 in. throat.
1 No. 42 Bliss Power Press.
2 No. 2 Otis Presses. Wheel 24 x 3½ in. New.
1 No. 4 Merriman Power Press New.
1 Heavy Screw Press, 3-in. diam. Screw.
1 Ferracute Screw Press.
1 Small Screw Press.
10 Foot Presses, various sizes.
1 Hand Punch, ¾-in. hole in ¾-in. Iron.
1 Wilcox Drop Press, 850-lb. Hammer.
2 Merrill Drop Presses, 400-lb. Hammers.
1 Drop Press, 7-ft. guides, 11-in. space, 120-lb.
1 Hydraulic Wheel Press.
1 Double Head Bolt Cutter.
1 Durrell 7-Spindle Upright Nut Tapper.
1 100-lb Jenkins' Patent Vulcan Power Hammer.
1 40-lb. Bradley Hammer.
1 60-lb. " "
1 200 lb. Bradley Hammer.
1 Trip Hammer, 8 ft. Lever.
1 Steam Crane 10 tons, 28 ft. jib.
1 No. 4 Bradley Furnace.
1 Alden Stone Crusher, No. 6.

The above are all in first-class condition, and will be sold at very low figures.

Have also a lot of new machinery for sale at bottom prices.

This list is changed every week, and if it does not contain what you want, write us, stating particulars. Machinery bought, exchanged or sold on commission.

Badger & Stetson,
49 Dey St., New York City.

RECEIVER'S SALE

OF

MACHINE SHOP, FOUNDRY AND BLACKSMITH SHOP.

All Materials, Machinery, Tools, Fixtures and Personal Property in the Iron Foundry, Machine Shop and Blacksmith Shop of G. H. Zschech & Co., Nos. 180 to 190 South Pennsylvania street, Indianapolis, Indiana, are offered for sale by order of court.

Said Iron Foundry and Shops are in good running condition. The plant is well established. Circular and Band Saw Mills and all other articles usually made in a first-class foundry are successfully manufactured here.

Sealed bids upon all or any part of the property, in cash or upon such terms as may be offered, will be received by me at any time before 1 o'clock, December 1, 1885, and will be opened at that time. A complete inventory and appraisement will be mailed on application.

JAMES JOHNSON,
Receiver of G. H. Zschech & Co.,
Indianapolis, Indiana.

PROPOSALS FOR BUILDING A STEAM PROPELLER FOR THE QUARTERMASTER'S DEPARTMENT.

DEPOT QUARTERMASTER'S OFFICE,
CORNER HOUSTON AND GREENE STS.,
NEW YORK CITY, Nov. 2, 1885.

SEALED PROPOSALS, in triplicate, with a copy of this advertisement attached to each, are invited and will be received at the office of the Chief Quartermaster, Division of the Pacific, Presidio of San Francisco, California, until 10 a. m., standard Pacific time, or at this office until 1 p. m., standard Eastern time, Dec. 30, 1885, at which time and places they will be opened in the presence of bidders, for the construction of a Steam Propeller for the United States Quartermaster's Department, for service in the harbor of San Francisco, California.

The hull of the vessel to be of iron or homogeneous steel.

Plans and specifications, with all other necessary information, will be furnished to bidders on application to the Chief Quartermaster, Division of the Pacific, Presidio of San Francisco, California; the Depot Quartermasters at Washington, San Francisco, Baltimore, Philadelphia and Boston, and at this office.

The vessel to be delivered to the Quartermaster's Department at San Francisco, California.

The right is reserved on the part of the United States to reject any or all bids.

Proposals should be indorsed "Proposals for Constructing a Steam Propeller," and addressed to the undersigned, or to the Chief Quartermaster, Division of the Pacific, Presidio of San Francisco, California.

No bids by telegraph will be entertained.

HENRY C. HODGES,
Deputy Quartermaster-General,
United States Army.

Virginia Manganese.

For sale, 300 tons Crude, mined, analyzing 67.70 Peroxide Manganese. Also Asbestos, Sulphide of Antimony, Chrome Ore, and Sole Agents for Brandau's American Venetian Red and Spanish Brown.

C. L. OUDESLUYS & SON,
71 Exchange Place, Baltimore, Md.

A. J. Sweeney & Son,

WHEELING, W. VA.,

Solicit correspondence with parties desiring Machinery, &c. Complete outfits for Nail Factories and Rolling Mills.

SITUATION WANTED—by a practical Sheet Steel Roller, well experienced in Saw Plates and Thin Sheets; a thorough mechanic; good draughtsman and capable of superintending the erection of a new plant for manufacturing Crucible Steel. Address WM. WILSON,
P. O. Box 0, Middletown, N. Y.

WANTED.—A Salesman who has a thorough knowledge of Guns and Cutlery, to canvass the Jobbing trade of the South. Address, stating name, references and full particulars, which will be confidential. "SOUTHERN,"
Office of *The Iron Age*, 83 Reade St., New York.

Special Notices.

MACHINERY.

SECOND-HAND, A1 ORDER.

Brown & Sharpe Universal Miller. Large and small.
Pratt & Whitney No. 2 Miller. Lincoln Pattern.
" " No. 1 and No. 2 Hand Miller.
Brainard Miller No. 8.
Pratt & Whitney Cutting-Off Machine, 2½ in.
" " Marking Machine.
" " Screw Machine No. 3.
" " Engine Lathe, 15 in. x 6 ft.
" " " " 16 in. x 5 ft. Taper.
Brown & Sharpe " " 16 in. x 7 ft.
Putnam Engine Lathes, 17 in x 6½ ft. No screw. Rod feed only.
Ames Engine Lathe, 16 in. x 6 ft. Complete
Lincoln " " 17 in. x 8 ft. "
New Haven " " 18 in. x 8½ ft. "
Harrington " " 20 in. x 8 ft. "
Putnam " " 20 in. x 10 ft. "
Perkin's " " 26 in. x 16 ft. "
Putnam " " 42 in. x 15 ft. Rod feed only.
Saunder's 8-inch Pipe-Threading Maachine, patent dies. Good as new.
22 in. x 5 ft. Planer. Putnam.
22 in. x 4 ft. " Wheeler.
36 in. x 12 ft. " Niles.
42 in. x 12 ft. " N. Y. S. E. Co.

Bolt Cutters, Milling Machines, Drills, Shapers, Lathes, Planers, &c., *new*, and also a line of second-hand machines not mentioned above.

State what you want to buy, and we will be glad to correspond with you.

Call and see us.

E. P. BULLARD,
14 Dey Street, New York.

MEYER, KINGSLAND & CO.,

Wholesale Auctioneers,

No. 10 Warren St., New York.

Regular sales of Hardware, Cutlery, &c. Sales cashed promptly. Consignments of goods solicited.

FOR SALE.

29 in. x 16 ft. Engine Lathe. G. M. Fifield.
13 in. x 5 ft. Engine Lathe. Bement.
60 in. Pulley Turning Lathe. New.
60 in. Pulley Turning Lathe. Nearly new.
50 in. Boring Mill. Phila. Hyd. Works.
36 in. x 10 ft. Planer. N. Y. Steam Eng. Co.
10 in. x 5 ft. Blaisdell Speed Lathe.
15 in. x 6 ft Back-geared Foot Lathe.
18 in. Column Drill Press.
3-Spindle Nut Tapper.
A. G. BROOKS, 261 N. 3d St., Phila.

FOR SALE.

Merchantable Hoops, 1¾ x No 16 and No. 17, and 1½ x No 17, in lengths from 2 to 5 feet.

A. R. WHITNEY & CO.
P. O. Box No. 33, New York City.

E. BISSELL & CO.,
Wholesale
HARDWARE AUCTIONEERS,
83 Chambers and 65 Reade Sts., New York

Sales held weekly for the trade. Consignments solicited. We refer to the leading manufacturers and importers.

A FINE FACTORY,

With railroad switch, for lease or sale. Plant 160 x 150 feet; one three-story and one two-story buildings with main shafting; 40-horse-power Engine. Boiler in perfect order.

Address CHAS. E. NIXDORFF,
St. Louis, Mo.

Cotton Gin Ribs.

HARDWARE MERCHANTS

and others furnished with materials of all kinds for making and repairing COTTON GINS. RIBS and SAWS for repairing ALL makes of gins. Send for Price List. Address THE BROWN COTTON GIN CO., Manufacturers of Cotton Gins, Feeders and Condensers. New London, Conn.

Vulcan Works, Baltimore, Md.

This old-established Foundry and Machine Shop for sale or lease. Has a complete equipment in all departments. Tools for sale. Send for catalogue. Address as above.

FOR RENT.

A valuable mill property located in Philadelphia, with business thirty years' established; both Water and Steam Power attached.

Address BOX No. 706,
Philadelphia Post Office.

Specialties in Cutlery.

Having unexcelled facilities for manufacturing novelties in Cutlery, Shears, Edge Tools, &c., we solicit correspondence with inventors or any who desire to have these articles manufactured and pushed. EMPIRE KNIFE CO.,
West Winsted, Conn.

SEELEY, CHURCH & COMPANY,
PACIFIC COAST AGENTS
FOR EASTERN MANUFACTURERS

IRON, STEEL, HARDWARE, &c.

Correspondence solicited.
No. 309 California St. (Rooms 6 and 7), San Francisco, Cal

SALESMAN desires engagement with first-class manufacturer. Has had large experience in the sale of all kinds of *Iron, Steel and Nails.* Has extensive acquaintance through Western and Southern States. Is competent to handle any lines of kindred goods that naturally go with Iron and Steel.

Address, "IRON SALESMAN,"
Office of *The Iron Age*, 77 4th Av., Pittsburgh, Pa.

WANTED.—By a practical man a situation as Foreman Moulder in an Iron Foundry. Have had 15 years' experience as Foreman and am thoroughly competent to take the full charge of a jobbing foundry of any size or any class of work and run it to a profit. A large shop preferred. Best of reference.
Address to "IRON MOULDER," Box 886,
Office of *The Iron Age*, 83 Reade St., New York.

A graduated Mechanical Engineer and Draughtsman with several years' experience in designing of Furnaces and Hydraulic Machinery for Rolling Mills, and at present connected with a leading establishment, wishes to change his position. An engagement with a Steel Works preferred. Address "H. W. N." Office of *The Iron Age*, 83 Reade St., N. Y.

Trade Report.

British Iron and Metal Markets.

[*Special Cable Dispatch to The Iron Age.*]

LONDON, WEDNESDAY, November 18, 1885.

Scotch Pig.—The market is a little firmer. We quote makers' brands as follows:

Coltness, alongside, Glasgow			50/
Langloan,	"	"	48/
Gartsherrie,	"	"	46/
Summerlee,	"	"	49/
Carnbroe,	"	"	45/
Glengarnock,	"	Ardrossan	45/6
Eglinton,	"	"	42/6
Dalmellington,	"	"	43/
Shotts,	"	at Leith	47/

Lighterage from Ardrossan to Glasgow is 1/ ₱ ton.

Cleveland Pig.—Market a little steadier. We continue quotations, f.o.b. shipping ports:

Middlesboro,	No. 1 Foundry	37/
"	No. 2 "	36/
"	No. 3 "	33/ @ 33/6
"	No. 4 Forge	32/

Bessemer Pig.—The market is steadier. W. C. Hematites are quoted 43/6 for mixed lots, Nos. 1, 2 and 3, equal portions, f.o.b. shipping ports.

Manufactured Iron.—The market is irregular. We quote at works:

		£	s.	d.	£	s.	d.
Staff. Ord.	Marked Bars	7	10	0	@	....	.
"	Medium "	6	0	0	@	6 10	0
"	Common "	5	10	0	@	5 15	0
Hoops, 20 W. G. and over.							
"	Common Best	6	15	0	@	.....	
"	Medium	6	5	0	@	6 10	0
"	Common	6	0	0	@	6 7	6
Sheets, 20 W. G. and under.							
"	Ordinary Best	7	15	0	@	8 5	0
"	Common	7	5	0	@	7 15	0

Steel Rails—Are unchanged. We quote £4. 15/ @ £4. 17/6, f.o.b. shipping ports.

Old Rails.—Market is a little steadier. We quote Old D. H's, c.i.f. New York, £3 @ £3. 2/6.

Scrap.—There is no change to report. We quote Heavy Wrought £2. 10/ @ £2. 15/, c.i.f. New York.

Copper.—The market is firmer. We quote Best Selected, £44. 10/ @ £45. 10/, and Chili Bars, £42. 10/ @ £42. 15/.

Tin.—The market is a little firmer. Straits Tin, spot, is quoted £92. 5/ @ £92. 15/, and futures £92. 15/ @ £93. 10/.

Tin Plates.—The market is irregular. We quote:

Tin Plates, 10x14,	1st qual.	Charcoal		19/6 @ 21/6
" "	2d "	"	...	18/6 @ 19/
" "	1st "	Coke	.....	17/6 @ 18/
" "	2d "	"	.. ....	14/6 @ 15/

Spelter.—The market is unchanged. We quote Ordinary at shipping ports, £14 @ £14. 5/.

Lead—Market is unchanged. We quote Common English Pig, £11. 12/6.

Freights.—Steam from Glasgow to New York, 1/6 @ 2/6.

Financial.

Office of *The Iron Age*,
WEDNESDAY EVENING, November 18, 1885.

A disturbing factor in the week is the outbreak of hostilities known as "the Balkan war," but further intelligence must determine the future course of the export markets, whatever may be the temporary effect. Disturbances in Burmah also have a bearing on commercial interests which may become more apparent at a later date. The first effect of warlike advices was a sharp upward movement in the grain markets. The feeling is decidedly firm and bullish. Fluctuations during the week were as wide as 5¢, but present quotations are about midway. Spot cotton is 1/32¢ higher, and steady. Speculation on the Stock Exchange has assumed larger proportions than before since the great boom of 1885 was inaugurated, until at the present moment the prices of leading stocks as a whole are advanced about 36 %, as compared with one year ago, although the impartial observer discovers nothing in the general situation, as regards freight movements, railroad earnings or the condition of foreign trade, to warrant such a sudden reaction from the extreme depression lately prevailing. The chief stimulus is found in the abundance of idle money, which professional syndicates and pool managers are able to turn to account in the speculative arena. From present appearances the importance of the pooling agreement so happily reached among the trunk lines has been enormously overrated. The Baltimore and Ohio is understood to be the only signature still withheld. A Pennsylvania Railroad official is quoted as saying that no contract exists giving the latter the use of its tracks into New York City.

The stock market has advanced from day to day throughout the week, and the closing day is noticeable from the fact that transactions were the largest known in the annals of the exchange, and prices the highest since the inception of the boom. On Thursday the upward movement was vigorous, stimulated by higher prices in London and free buying on foreign account. Pacific Mail was said to have renewed its contract with the Pacific roads on the basis of $85,000 guaranteed per month. On Friday the market was buoyant at about the best figures. News of the Balkan war caused only temporary disturbance on Saturday, the invigorator and paralyzer being applied by turns. Announcement was made that the percentages agreed to under the trunk-line contract would be awarded in a few days. On Monday commission houses in some instances warned their customers to "go slow." In spite of repeated raids and realizing sales the market to the present writing continues strong and active. Quotations are as follows: Central Pacific, 48⅞; Delaware and Hudson, 99⅞; Denver, 23; Erie preferred, 55⅛; Houston and Texas, 39½; Lake Erie and Western, 17⅞; Louisville, 51⅜; Manitoba, 119; Missouri Pacific, 105¼; New York, Chicago and St. Louis, 11⅜; New York and New England, 36¼; Jersey Central, 46⅜; Northwestern, 114¼; Northern Pacific, 30¼; Ohio and Mississippi, 26¼; Oregon Railway, 105. Oregon and Transcontinental, 34⅞; Oregon Improvement, 33⅞; Pacific Mail, 64⅝; Reading, 25; St. Paul, 97⅞; Omaha preferred, 105½; Manitoba, 107¼; Texas and Pacific, 23⅜; Union Pacific, 62¾; Wabash, 15½; Western Union, 80⅛; Erie, 27⅞; Lake Shore, 88⅜; Michigan Central, 79⅜.

The great expansion in monetary transactions is shown in the volume of clearing-house exchanges, which last week increased 39½ %, compared with the corresponding week last year; outside of New York 26 %. All the larger cities show gains except Baltimore and San Francisco. The improvement in Cincinnati, St. Louis and Pittsburgh is very slight. According to *Bradstreet's* the movement of merchandise has not increased. Manufacturers in the East in some instances claim to be doing as well as one year ago. In New York dry-goods jobbers notice the appearance of buyers from nearly all sections, which augurs an early improvement.

The bank statement showed an unexpected gain of $1,041,300 in surplus reserve, which now stands at $26,495,150, in comparison with $37,474,535 this time last year. Loans were slightly contracted. The money market has fluctuated less than last week, but rates continue to show a gradually hardening tendency. It is noticed that banks show more discrimination in loans on stock collaterals. Commercial paper has never been in such short supply at this time of the year. In the West country banks have less use for money than earlier in the fall. We quote 60 to 90 days' indorsed bills receivable at 4 @ 4½ %. Exchange is dull and steady at $4 83 for long and $4.85½ for short, and actual rates are within a fraction of the gold importing point. The Bank of England discount rate was raised to 3 %.

The imports of merchandise at this port during the week were $405,530 below those of the previous week, the total valuation being $6,847,046, making the aggregate since January 1 $370,933,953, as against $377,409,876 for the same time last year, and $408,207,000 for 1883. The exports of merchandise from this port during the past week were $311,077 above those for the previous week, the total valution being $6,431,943, making an aggregate of $291,727,046 since January 1, as compared with $286,226,510 for the same time last year. Included were the following: 19,631 barrels apples, 73,915 barrels wheat flour, 168,778 bushels wheat, 325,659 bushels corn, 28,500 bales cotton, 4,207,683 gallons petroleum, 5,538,251 ℔ cut meats, 5,863,567 ℔ lard, 3682 hogsheads tobacco.

According to the Custom-House report the imports of specie for the week were $266,082, making the total since January 1 $11,181,825, as compared with $20,741,268 for the same time last year. The exports of specie for the week were $149,066, making a total of $20,911,746 since January 1, of which $13,919,987 was in silver.

A Washington special says that, contrary to expectation, an unusual number of banks have applied for an extension of their corporate existence, not so much from the expectation of profits from their circulation as to enjoy the confidence arising from Government supervision and control.

The sale of the West Shore Railrod under foreclosure has been fixed for the 24th of this month, the Supreme Court having refused to postpone it, and Judge Brown awards two receivers $80,000 instead of $700,000, which they were modest enough to demand.

The Atlantic State Bank, of Brooklyn, paid the remaining 40 per cent. due its depositors at the time of its suspension.

The chief of the Bureau of Statistics reports that the exports of cotton from the United States during the month of October were 607,921 bales, valued at $30,369,184; during the same month in 1884, 563,421 bales, valued at $28,223,292; for the three months ended October 31, 793,919 bales, valued at $39,684,145; same period last year, 761,128 bales, valued at $38,577,758. The total values of the exports of breadstuffs for the month of October were $10,225,347; 1884, $11,772,506; four months ended October 31, $35,724,918; same period last year, $54,294,662.

The total number of failures throughout the United States for the year to date, as reported to *Bradstreet's*, amounts to 9627, as compared with 7704 for a corresponding portion of 1884, with 8356 in 1883, and with 6602 in 1882. The past week is conspicuous for showing a remarkable increase in the number of failures throughout the country, the total being 227, against 156 last week, a gain of 71.

Metal Market.

Copper.—Since our last report a much better feeling has been prevailing in response to the improvement in the London market, this feeling, as well as the London advance, embracing pretty much all Metals. In Copper the rise has been considerable in the London market; partially it may have been a natural rebound from an exaggerated, not to say senseless and panicky, decline, and partially it has probably been speculative, and such speculation, if there be any, may this time be backed by strong Anglo-Chilean financial men and merchants; hence the change may prove even more important in its future bearings than the actual rise so far attained. An unusual interest therefore attaches to this change on this side likewise, and we trust the hopes of those interested in Copper may be fulfilled to their full extent. On the 12th inst. Chili Bars still stood £39. 2/6 in London; the next day, £39. 17/6; November 14, £40. 2/6; November 16, £40. 15/6; November 17, £41, and this morning £42, and later advices 10/ better, Best Selected meanwhile recovering to £45. No greater activity has been started here during the week, but we are much firmer at 11¢ for Lake Superior, Arizona at 10⅜¢ @ 10½¢, and Baltimore and Orford 10¢ @ 10⅝¢. According to Messrs. James Lewis & Son's, Liverpool, October 31, report, the import of American Copper has been during the first 10 months into Liverpool and Swansea 20,986 tons, against 14,645 in 1884, 6952 in 1883, and 586 in 1882. The visible supply as per circular of Messrs Henry R. Merton & Co., London, on that date in England and France was 56,547 tons, against 41,760 last year, and 46,833 in 1883, and the price of Bars was £39. 10/, against £52. 12/6 and £61. 5/. For manufactures in this market dealers get 15¢ for new Sheathing Copper, 16¢ for Braziers, 15¢ for Bolts, and 18¢ for Bottoms. From London we are cabled this afternoon that the market is firmer.

Tin.—In London the market has advanced to £92. 5/, Straits Spot, this morning, and three months to £92. 15/, closing strong. Here we have been only moderately active, but the quotation for Straits Tin has advanced to 20½¢, spot, large lines, and 20¼¢, jobbing lots. The visible supply in Europe and America on October 31 was 13,171 tons, against 13,913 last year. We are cabled from London this afternoon that the market is firmer. *Tin Plates*—Have led to only a comparatively small business at sustained prices. We quote toward the close, large lines, ordinary brands, ₱ box: Charcoal Bright, $5.10 @ $5.15; do. Ternes, $4.40 @ $4.50; Coke Tin, $4 47½@ $4.60, and do. Ternes, $4.30. Liverpool is steady at 16/6 @ 17/, Charcoal, and 14/6 @ 15/, Coke. From London we are told that the market is irregular.

Lead.—The market has maintained its strength. There sold in lots altogether 200 tons Common Domestic at $4.20 @ $4.25, and 500 tons Refined at 4¼¢. Soft Spanish advanced in London 5/ to £11. 10/. Manufactures are quoted as follows: Lead Pipe, 5¾¢ ₱ ℔; Sheet Lead, 6¼¢; Tin-Lined Lead Pipe, 15¢, and Block-Tin Pipe, 40¢, allowing in trade for Old Lead delivered in New York, 3¢ ₱ ℔. Shot, Drop, 6¢; Buck, 7¢; Chilled, 7¢. Shot in 5-℔ bags, 1¢ ₱ ℔ extra. We are cabled from London this afternoon that the market is practically unchanged.

Spelter and Zinc.—Not much has transpired during the week, but the little done sustains the figure of $4.45 @ $4.65 for Common Domestic, Silesian being worth $4.90 @ $5. In London the latter improved 2/6 to £14. 15/. We quote Bertha Refined as heretofore, 7¼¢ @ 8¢; *Sheet Zinc* unchanged—quiet at $5.70 @ $5.90. From London we are cabled that the market is unchanged.

Antimony.—The dullness continues. We quote Cookson 9½¢ @ 9¾¢, and Hallett 8¾¢ @ 9¢. No change in London, where Hallett is worth £35.

Coal Market.

The Anthracite Coal market is very dull, and prices are quoted this week without change. The stimulus attending the recent advance having subsided with the placing of orders, a succeeding period of quietness is natural, at least until the coming of a more frigid temperature. The general condition of the trade is considered good, with every prospect of a satisfactory business for the year. At some points anxiety is manifested to anticipate the close of navigation, which must be near at hand. Freights are still very firm. As to prices Pittston affords about a fair average, viz: Lump, ₱ ton, $3 30; Grate and Egg, $3.25 @ $3.35; Stove, $3.90; Chestnut, $3.60; Pea, $2.30; 50¢ ₱ ton additional delivered in New York, or 35¢ ₱ ton alongside. Rumors of strikes in the Anthracite region of Pennsylvania have caused uneasiness, but it is affirmed in official quarters that they are without real foundation.

The stock of Coal on hand at tidewater shipping points October 31, 1885, was 661,616 tons; on September 30, 1885, 815,907 tons; decrease, 154,291 tons.

The production of Anthracite Coal during October, officially announced, was 3,562,166 tons, making a total since January 1 of 25,347,588 tons, or an increase as compared with last year of 291,985 tons.

The total amount of Bituminous sent to the Eastern markets thus far in the year 1885 is 4,929,879 tons, compared with 5,340,343 tons for the corresponding period last year, a decrease of 410,464 tons. The Bituminous operators are said to have recently closed some important contracts.

In Hocking Valley, Ohio, the miners advise a general suspension throughout the State, and the operators resolve to stand firm for a 50¢ rate.

Trade Report.

New York Iron Market.

There is a sharp difference at the present time between the Iron and the Steel trade. In Structural Iron, Bars, Plates and Shapes, the market is dull and apathy rules supreme. In everything that pertains to the Steel-Rail trade all is activity. Ore, Pig Iron, Spiegeleisen, are firm and active. The advance in Steel Rails, which is still within fair bounds, now threatens to reach a point where it may foster a speculative feeling on the part of outsiders in other lines in the Iron trade. It is being very actively misinterpreted in that way. Rails were far too low, and the accumulated demand due to the poverty of the railroads is now making itself felt. It has been precipitated by the formation of the combination, and what would otherwise have been six months' business has been crowded into two. Never before in the history of the Rail trade have consumers so generally called for so much work so far ahead, and they would not have done so had not an advancing tendency been shown. But it does not follow that business is going to continue at this rate. Even the most sanguine do not place the 1886 requirements above 1,200,000 tons, which the Rail mills can furnish readily. Nearly 600,000 tons have been placed, and therefore the next 12 months, taken together, will not see more business done than during the past three. What is true of Rails is true of all the materials entering into them. The mills have all promptly covered their requirements. It does not follow that what has been done in Rails can be done in Pig Iron and Manufactured Iron. In the former business there is only one concern where there are dozens in the latter. Pig Iron and Manufactured Iron must await the tedious process of the demand coming up to the capacity. Combinations like that in the Rail trade are out of the question. There are many indications of an improvement, and there is undoubtedly a better feeling, but there is nothing to warrant outside speculation.

American Pig.—The feeling is one of greater strength, and, taking some of the most actively competitive markets in this State, where outside Irons contest the territory most, a little better prices are, in the average, being obtained. The question of prices for 1886 delivery is still in abeyance. One of the points brought up in connection with it is that the consumption in the early months of the year is generally light, so that the furnaces usually accumulate some stocks. As the latter are very light now, this feature is one that will not have as great an influence as usual. There is some talk of an impending speculative movement in Pig Iron, and the possibility of discouraging or checking it is occasionally discussed. Charcoal Irons are still low, but attention is called to the fact that orders for cars are growing more numerous, among others there being one for 1000 cars for a New England road in the market. A general movement to renew the much-battered rolling stock of the country would very favorably affect this industry, which has been in a depressed condition for so long a time. We quote standard brands of Lehigh and North River Irons, tidewater delivery, nominally as follows: No. 1 X Foundry, $18 @ $18.50; No. 2 X Foundry, $16 @ $16.50; Gray Forge, $15 @ $15.50; the outside figure is asked for special brands. Outside brands sell for 50¢ @ $1 less than our quotations. The growing strength of the market is chiefly exhibited in the lessened eagerness to place outside brands.

Scotch Pig.—Advices from the other side are stronger. The market here is quiet and steady. We quote nominally as follows for round lots: Coltness, $19.50 @ $19.75 to arrive; Gartsherrie, $19.50 to arrive; Shotts, $19.50 @ $19.75 to arrive; Carnbroe and Glengarnock, $18.50 to arrive; Summerlee, $19 @ $19.25 to arrive; Dalmellington, $18 @ $18.50 to arrive; Eglinton, $17.50 @ $18 to arrive, and Clyde $18 @ $18.50 to arrive.

Bessemer Pig and Spiegeleisen.—The movement on the part of the Steel mills to cover for the materials of sales made, with which coincided a demand from some of the Open-Hearth Steel works, has created considerable activity. One of the Eastern Rail mills has taken a lot of Foreign Bessemer, and Western Open-Hearth works have purchased about 12,000 tons of English Hematite Iron, delivered at Baltimore in 1886, at $19 25 @ $19.75. We quote here for Foreign Bessemer $19.25 @ $19.50. The English market is reported to be excited over the American purchases. Some transactions in American Bessemer are also reported. In Spiegeleisen a good deal of business has been done, chiefly in English material, only one lot of 1000 tons of German material having been placed. We quote $26 @ $26 25, according to quality and delivery. Ferromanganese, 80 %, is quoted $67 @ $68.

Iron Ore.—We note a sale of 40,000 tons of Foreign Ore at private terms. Advices from Cleveland state that purchases there have been heavy and have made a heavy inroad into stocks accumulated for winter delivery. In the East, we understand that the Chateaugay Co. have placed fully 200,000 tons of Ore at prices which are about the same as those of last year.

Bar Iron.—The market is quiet. The coming closing of navigation will cause the withdrawal of some sellers from this market; on the other hand, the demand generally slackens considerably during the winter months. We quote for delivery here in round lots: Common Iron, 1.45¢ @ 1.55¢; Medium, 1.55¢ @ 1.65¢, and Refined Iron, 1.75¢ @ 1.9¢, with half extras. Steel, 1.90¢ @ 2.10¢ base. Store prices are 1.6¢ @ 1.75¢ for Common, 1.75¢ @ 1.8¢ for Medium, and 1.9¢ @ 2¢ for Refined.

Structural Iron.—The market is quiet. Angles may be quoted nominally 1.95¢ @ 2.05¢, delivered, for round lots, and Tees at 2.25¢ @ 2.4¢. Store quotations remain 2.2¢ @ 2.4¢ for Angles, and 2.5¢ @ 2.7¢ for Tees. American Beams and Channels are 3¢ base from dock for all orders.

Plates.—There are some round lots on the market, which are actively competed for. We quote for round lots: Common or Tank, 2¢ @ 2.1¢; Refined, 2¼¢ @ 2⅜¢; Shell, 2.4¢ @ 2½¢; Flange, 3.4¢ @ 3½¢; Extra Flange, 4¢ @ 4¼¢. For small lots of Steel Plates the quotations are as follows: Ship, 3¢ on dock: Tank, 2½¢ on dock; Boiler, 3¢ @ 3¼¢ for Shell, 3½¢ @ 4¢ for Flange, and 4¢ @ 5½¢ for Extra Flange and Fire-Box.

Merchant Steel.—Quotations for the range from ordinary to good grades are as follows: American Tool Steel, 7½¢ @ 10¢; Tool Steel of special grades and finer qualities, 12¢ @ 20¢; Crucible Machinery, 4.5¢ @ 6¢; Spring and Tire, 2⅛¢ @ 2¾¢; Open-Hearth Machinery, 2¼¢ @ 2¾¢, and Bessemer Machinery, 2¢ @ 2½¢; English Tool, 13½¢ @ 15½¢; Common grades, 7¢ @ 9¢.

Steel Rails.—In the aggregate there have been sales of 30,000 tons by Eastern mills. The largest lot, one of 10,000 tons, was placed at $33 at a mill which until then had not booked orders. Other smaller lots were taken at the same figure, others again at $34, and one, it is reported, fetched $35 at mill. The Western works have not yet advanced quite to the parity of these prices. Some of the Eastern mills are now asking $35, and are undoubtedly indifferent now to accepting further orders for the present. Others are willing to book at $34, and, under special circumstances, where it is a question of filling gaps in work for some months, might accept even less. While some of the mills are virtually out of the market, there are a few whom the advance only now enables to book orders, since location or character of plant have told against production at the lower figures. The sudden advance has filled an influential element in the trade with some uneasiness, but there is still sufficient inquiry in the market, which, if pressed, will lead to still higher prices. At the Philadelphia meeting of the Board of Control, Mr. Thurston, of the Bethlehem Iron Co., was chosen chairman to succeed the late Dr. Linderman. There is a party in the trade urging the pooling of the entire business somewhat on the model of the European syndicate. Some of the mills, however, strongly object to any changes.

Steel Wire Rods.—Nothing of any consequence has been done, and no heavy business is expected for some time to come. German makers quote £5. 13/9. Here the quotation remains nominally $41.50 @ $42.50.

Old Rails.—During the week there have been sales aggregating about 1000 tons to mills in Eastern Pennsylvania at figures equivalent to about $18.25 on cars, Jersey City. Some small lots have even brought $18.50. Holders generally evince a determination to ask higher prices.

Scrap.—Only small lots are changing hands. We continue our quotation of $18 @ $18.50 from yard for No. 1 Wrought.

Rail Fastenings.—Coincident with purchases of Rails, the roads are contracting for Fastenings, and a good deal of work for 1886 delivery is being closed. The Spike Association are holding Spikes at 2¢. We quote 2.75¢ for Bolts and Square Nuts, noting, however, that there is some irregularity; 2.9¢ @ 3¢ for Bolts and Hexagon Nuts, and 1.75¢ for Splice Bars.

Metal Exchange.

The following transactions are reported as having been closed on the floor of the Metal Exchange:

THURSDAY, November 12.

5 tons Tin, December	20.10¢
5 tons Tin, January	20.05¢

FRIDAY, November 13.

100 tons Pig Iron Certificates, March	$17
500 tons Pig Iron Certificates, April	$17
300 tons Pig Iron Certificates, March	$17

SATURDAY, November 14.

100 tons Pig Iron Certificates, March	$17

Philadelphia.

Office of *The Iron Age*, 230 South Fourth St.,
PHILADELPHIA, November 17, 1885.

Pig Iron.—There has been very little change in the position since date of our last report, and, while the demand is not large, prices are held with the utmost firmness. The supply immediately available at furnaces is smaller than has been known for years, but in the meantime it is probably a change of ownership more than anything else. Producers have sold, consumers have bought, but until a larger proportion has gone into actual consumption no great demand and no material change in prices can be expected. The time is approaching when something like definite calculations in regard to the outlook can be made, but at present it is very uncertain. A few days ago an immediate advance appeared to be pending; to-day the feeling is quieter, and, for reasons already mentioned, the market is a waiting one. Production, as shown in last *Iron Age*, is about 4000 tons per week greater than it was three months ago—quite an important item. Consumption has also increased considerably, but the position is not so definitely assured as to warrant further advance in prices. The disposition is to wait developments. Business is better all around—every one concedes that; but is it so much better that 4000 tons more Pig Iron per week are insufficient to fill up the gap? It may require weeks to answer that question, as it all depends on the outcome of business during the next 60 days. If the improvement continues, as there is reason to hope it will, a slight advance in prices may be made, and with that some increase in production. So far as actual business in hand is concerned there is nothing to warrant very sanguine expectations. Orders have been falling off for some time past, and, while consumers generally are in a vastly better position than they were a year ago, they do not average as much business on hand as they had six or eight weeks ago. This is not considered as an indication that a relapse is pending, but is to be attributed rather to the season of the year when a general contraction of business is expected. Still, as one quail on toast is better than half a dozen on the prairie, consumers are in no humor to pay advanced prices on Pig Iron until they find themselves absolutely in need of that article. Confidence in the future is based to a great extent on expected orders from the railways for Cars, Locomotives and other equipments, and, if these hopes are realized, renewed activity in Pig Iron will soon be felt. Meanwhile quotations remain steady and firm at $18 @ $18.50 for standard brands of No. 1 Foundry, $16 @ $16.50 for; No. 2, and $15.50 @ $16 for Gray Forge; special brands at from 50¢ to $1 above these figures.

Foreign Iron.—There is considerable inquiry from Rail manufacturers, with $19 @ $19.50 bid for large lots and $20 asked. Sales of about 10,000 tons at near $20. We quote, nominally: $19 @ $20.50, c.i.f., for Bessemer, according to brand; $26 for 20 % Spiegel, and $67.50 for 80 % Ferromanganese.

Blooms.—The demand is so light that quotations can hardly be made based on actual sales. Asking prices are about as follows: Soft Basic Blooms, $33.50 @ $35; Billets, $38 @ $39, and Siemens-Martin, $40 @ $42; extra quality, $43 @ $45; Domestic Blooms, $30.50 @ $32, delivered, for Nail Plate, and $35 @ $36 for Plate and Sheet Blooms; Charcoal Blooms, $50 @ $52; Run-out Anthracite, $43 @ $44; Scrap Blooms, $32 @ $33; Northern Ore Blooms, $32.

Muck Bars.—There is not much demand at the prices asked, although sellers are firm at $28 at mill for best makes, with medium qualities offered at from $27 to $27.50.

Bar Iron.—The demand is very slow, and under pressure to secure business prices are a shade lower. The demand for specialties has fallen off also, so that some of the mills are getting pretty well on to the end of their orders. Prices are somewhat irregular, but for Best Refined Bars 1.7¢ @ 1.75¢ is quoted, and for Skelp Iron 1.82½¢ @ 1.85¢.

Plate and Tank Iron.—The market is rather quiet, although small lots are in pretty good demand at full prices. Large orders are not on the market at present, and as mills have pretty well filled their old contracts there is some anxiety to replace them as soon as possible, although concessions in prices are not easily obtained. On the whole the market may be called dull, but steady, at prices as follows: Ordinary Plate, 2¢; Tank, 2.1¢; Shell, 2.5¢; Flange, 3.5¢; Fire-Box, 4.25¢; Steel Plates, Shell, 3.25¢; Flange, 3.5¢; Fire-Box, 4¢.

Structural Iron.—Business has been rather slow during the past week, very few of the mills having entered orders equal to their deliveries. Small lots are called for pretty frequently, but nothing of importance has been entered for some time past. Some very extensive operations are under consideration, but, as financial arrangements have not been completed, it is difficult to say whether the matter will be entered upon or postponed indefinitely. Prospects are fair, however, and it is not altogether improbable that some very heavy contracts will be on the market at an early date. As in other departments, however, there is a good deal of backing and filling, and it is hard to say what the final outcome will be. Prices steady and unchanged, as follows: Bridge Plate, 2¢ @ 2.1¢; Angles, 2¢; Tees, 2.3¢ @ 2.4¢, and Beams and Channels, 3¢.

Sheet Iron.—There is no change in this department; demand less active, but with light stocks prices are firmly held. Best makes are quoted at about the following prices:

Best Refined, Nos. 26, 27 and 28	4 ¢
Best Refined, Nos. 18 to 25	3¾¢
Common, ¼¢ less than the above.	
Best Bloom Sheets, Nos. 26 to 28	5 ¢
Best Bloom Sheets, Nos. 22 to 25	4¼¢
Best Bloom Sheets, Nos. 16 to 21	4 ¢
Blue Annealed	3 ¢
Best Bloom, Galvanized, discount	57½%
Common, discount	62½%

Wrought-Iron Pipe.—The Pipe market continues fairly active, but prices show no change. Stocks remain about the same as they have been for the past two or three weeks. Discounts as follows: Lap-Welded Black Pipe, 60 % off list price; Butt-Welded do., 42½ %; Butt-Welded Galvanized, 32½ %; Lap-Welded do., 42½ %; Boiler Tubes, 57½ %.

Nails.—The upward tendency in Nails still continues, prices having advanced 15¢ ℔ keg since last report. It is difficult to predict how high prices will go if the strike continues. Dealers are complaining about not being able to fill orders, there having been no such scarcity in Nails for a long time. Card rate, $2.75, less the usual discount.

Steel Rails.—The demand has been well maintained, and prices are again higher. Sales of lots ranging in quantity from 1000 to 10,000 tons each have been made at $33 at mill, and reports from good sources claim that several sales have been made at $34 for good-sized lots, which is now the general asking price, although it is not improbable that concessions would be made to desirable buyers as regards quantity and time for delivery. Prices are very firm, however, and with large contracts on hand sellers are in a position to command their own terms.

Old Rails.—Sales have been made for delivery at interior points at $20 @ $20 50. Nothing offered for Philadelphia delivery; price nominally about $19. The supply of Rails is extremely light, but it is not likely that prices will go much higher unless there is a general advance in other articles.

Scrap Iron.—There is a moderately active movement in Scrap Iron, but at quoted rates the supply is equal to the demand. Prices as follows, with extreme figures paid only for lots delivered at mills. No. 1 Wrought Scrap, $18 @ $19; No. 2 do., $12 @ $13; Horse Shoes, $22 @ $23; Turnings, $13 @ $14; Old Car Wheels, $14 @ $14.50; Old Steel Rails, $16; Fish Plates, $22 @ $23; Cast Scrap, $13.50 @ $14; do. Turnings, $10 @ $10.50.

Pittsburgh.

Office of *The Iron Age*, 77 Fourth Avenue,
PITTSBURGH, PA., November 17, 1885.

The more seasonable weather and drying up of the roads has caused a slight improvement in general business, but it is still far from being active. Our manufacturers generally report a fair volume of trade, but continue to complain of small margins. One of our oldest and most reliable capitalists, who is interested in quite a number of manufacturing concerns, and who has been actively engaged in the Iron business for many years, informs your correspondent that not one of the concerns in which he is interested has made any money this year. In the labor field there is nothing important to note. The Coal-miners' strike still continues, but the bottom is expected to drop out almost any time. The Nail manufacturers at their meeting last week reaffirmed their position, contrary to the expectation of a good many of the strikers, who counted on something very different.

Ores.—There is an active inquiry for Bessemer Ores, with little or none remaining in first hands. It is probable a number of furnaces now standing idle would be started up at once if there was any chance of getting a supply of Ore. For other descriptions of Ore the market presents nothing new, with the exception possibly of a firmer feeling under the influence of an increased demand

Pig Iron.—For Foundry and Gray Forge Irons the general position of the market is much the same as a week ago; the demand for the latter still appears to be increasing, while the former continues dull. A firmer feeling appears to obtain, however, and higher prices for the better qualities are looked for before long, as the supply of these is gradually being reduced. A good many of the cheap lots that have been pressing on the market for a year or more past have been picked up. Some of our banks and insurance companies have Iron which they took several years ago as collateral for money loaned, but most of them are holding for a better market. Bessemer Iron continues very firm and somewhat excited, and during the week under review a further advance has been established, and we may add in this connection that it is very scarce and hard to get, even at the advance. Sales are reported as having been made within the past few days at $18, cash, an advance of fully $1 ℔ ton within a few weeks. Quotations may be fairly given as follows:

Neutral Gray Forge	$14.50 @	$15.00,	4 mos.
White and Mottled	13.00 @	13.50,	4 "
All-Ore Mill	15.50 @	16.00,	4 "
No. 1 Foundry	16.50 @	17.00,	4 "
No. 2 Foundry	15.00 @	15.50,	4 "
All-Ore Foundry	17.50 @	18.00,	4 "
Cold-Blast Charcoal	25.00 @	27.00,	4 "
Hot-Blast Charcoal	18.00 @	22.00,	4 "
Bessemer Iron	18.00 @	.. ..,	cash.

Muck Bar—May be quoted at $26 25 @ $26.50, cash, and firmer. Some sellers are asking 25¢ @ 50¢ ℔ ton more than prices quoted.

Manufactured Iron.—There is a continued fair degree of activity. Sheet-Iron manufacturers are still behind with their orders, and there is no abatement in the demand for Skelp; a number of mills have been running almost exclusively on the latter since last spring. Prices are firmer, but unchanged. We continue to quote Bars at 1.60¢ @ 1.70¢ rates, and Skelp Iron at 1.75¢ @ 1.80¢. Manufacturers using Old Rails have stiffened in consequence of the enhanced cost of Rails, which are now bringing almost as much relatively as Pig Iron. Until quite recently those mills using Old Rails have been able to undersell those using Pig Iron.

Nails.—The situation remains substantially unchanged. The meeting of the Western Nail Association, last Wednesday, at Cincinnati, was largely attended, and the position of the manufacturers in regard to the strike reaffirmed. The number of machines now running in the West non-union is placed at 558, and increasing, and it is claimed that as a rule the Nails made by these non-union nailers are satisfactory—in many cases fully equal to the work of the regular nailers. The demand continues light and no material activity can be looked for until the spring trade opens up. Sales are being made in a jobbing way at prices ranging from $3.25 to $3 50.

Wrought-Iron Pipe.—Notwithstanding the season is now at hand when ordinarily the Pipe trade commences to fall off, the Pipe mills are still very busy, and it looks as if they would have all they can possibly do until the close of the present year. Prices firm, but unchanged. Discount on Black Butt-Welded Pipe in carlots and upward, 45 %; less than a carload, 42½ %; do. Galvanized, in carlots, 35 %; less, 32½ %; Black Lap-Welded Pipe, in carlots, 62½ %; less, 60 %; do. Galvanized, in carlots, 45 %; less, 42½ %. Discount on Boiler Tubes, 57½ %; 2-inch Oil-Well Tubing, 13¢ ℔ foot, net; 5⅝-inch Casing, 40¢; 8-inch Drive Pipe, $1.30.

Merchant Steel—There is a continued good degree of activity; some of the mills are quite busy, and, while prices are firmer, they remain unchanged. Best brands Refined Cast Steel, 8½¢; do., Crucible Machinery, 4½¢ @ 4¾¢; Open-Hearth and Bessemer do., 2½¢ @ 3¢.

Steel Rails.—Nearly all the mills in operation have contracts booked sufficient to absorb their entire production during the remainder of the present year, and buyers find it exceedingly difficult to find a seller for near-by delivery. For delivery next year prices are quoted at from $32 to $33, cash, at mill, for heavy sections.

Old Rails.—The market for Old Iron Rails continues strong and a good deal excited, and prices have further advanced. One of our brokers is reported as having made some sales at $21 @ $21.50, which, if correct, makes an advance of $1.50 @ $1.75 the past week. Old Steel Rails are also scarce and firm, and are quoted at $18 @ $19, according to lengths. We can report a sale of Long Lengths at $19.

Railway Track Supplies—Are firmer, but prices remain unchanged. Spikes, 2¢, 30 days, delivered; Splice Bars, 1.60¢ @ 1.70¢; Track Bolts, 2.75¢ @ 2 85¢.

Old Material.—No. 1 Wrought Scrap is still quoted at $16 @ $17 ℔ net ton; Wrought Turnings, $13.50 @ $14; Car Axles, $22 @ $23; Cast Borings, $10.50 @ $11, gross ton; for Old Car Wheels, it would be difficult to get over $14.50, gross, but brokers say they cannot be brought here from any point either East or West to sell at that price. All kinds of Scrap Steel are scarce and firm; Steel Rail Ends, in absence of sales, may be quoted at $19 @ $19.50, and Steel Bloom Ends at $18 @ $18.50.

Window Glass.—Manufacturers continue to quote discounts at 75 % on Single and 75 and 10 % on Double Strength.

Coke.—Blast-Furnace Coke remains unchanged at $1.20 ℔ ton, free on cars at ovens.

Chicago.

Office of *The Iron Age*, 36 and 38 Clark St.,
Cor. Lake St., CHICAGO, November 16, 1885.

Hardware.—In the volume of trade there has been a slight decline, though the demand for seasonable specialties has somewhat improved. The market for the remaining weeks of this year is likely to be greatly influenced by the atmospheric conditions, and if a steady cold prevails will result in continuing the demand for Stoves, Pipe, Elbows, Coal Hods, Ash Sifters, Ice Tools, Shovels, Axes, &c. In this class of goods the season has thus far been very satisfactory, and in the general distribution of all lines considerably in excess of several previous years for the same period. Wooden Ware, such as Buckets and Tubs, are in fair request, while Tin Plates and Window Glass are only moderately active. Paints and Oils are in good demand, with an increase in the call for Chains, Blacksmiths' Tools, Wagon and Sleigh stocks, and similar lines of Heavy Hardware. In Stamped and Granite Ware the market is stronger and buyers are increasing their orders. The war on Cartridges has subsided, and jobbers now quote 60 % discount on Rim and 40 % on Center Fire, and have advanced the price on Shot from $1.17 to $1.25, regular. Prices on all lines are noted as steady, with a tendency to higher quotations. The position is quite different from what it was at the beginning of the year, when all changes were downward. Now whatever change is made is toward getting better prices, no matter how small the advance. As the year's trade draws to a close the absorbing topic with all dealers is the question as to what means or remedies may be adopted to secure better profits on goods for next year's consumption.

Barb Wire.—The position of manufacturers on price has been somewhat strengthened during the past week. This was brought about by the Plain-Wire makers, who, at their meeting, reaffirmed the price of $2.80 on Plain Wire, and have set in motion a scheme by which they will be enabled to pool their product and award to each mill a pro rata share of the entire product. In this manner they will be able to regulate the

quantity and control prices so that manufacturers of Barb Wire will be in a sense restricted from cutting rates beyond a certain limit on the finished product. Quotations on Barb Wire continue to be $3.50 for Painted and $4 50 for Galvanized from store, with the usual discount from mill. Makers are accepting orders only for delivery previous to the 1st of January, and are more largely interesting themselves in consummating the combination company this week. Many of the large jobbers and retailers have endeavored to place orders for spring delivery at present prices, but mills are unwilling to take contracts, and are in many instances standing idle. From all that can be learned there is likely to be a pretty full representation from those who have signed the agreement, and at present indications point toward a satisfactory organization.

Nails.—The only change that can be noted is the fact that stocks are gradually increasing, which is believed to be the result of a slight decline in demand rather than an increase in product. Since Nails are becoming more plenty we now and then hear of a cross-road dealer who ordered Nails a month ago that could not be supplied, who is now demanding that they be delivered to him at the price then quoted. Many of them have labored under the impression that orders not filled would be booked and supplied later on. We make this statement for the purpose of informing the trade that in no case did jobbers book orders for future shipments, and all orders that were not filled at the time were considered void unless otherwise stated by the seller. Jobbers could not well supply Nails ordered when selling rates were $2.25 @ $2 50 from stocks which cost them $2.85 @ $3 laid down here. The result of the meeting in Cincinnati last week has cleared the atmosphere from everything that looked like a compromise on the part of the manufacturers. For the present everybody feels satisfied that they will not concede to the nailers' demand, and that the position of the market will remain pretty firmly at its present standing until January 1 at least. Jobbers, however, are not inclined to increase their stocks beyond the supply necessary for immediate demand, but have as a rule full assortments of Iron Nails. Steel Nails are more scarce and carried in less quantities and by fewer dealers.

American Pig Iron.—Sales agents report that the past week has been one of average sales compared with the past two months. We are convinced, however, in looking over the market, that we cannot find the same activity among consumers that existed several weeks ago, and in our judgment there is less buying and also less cause to buy at the present moment. This statement is based upon the fact that furnacemen decline to sell large quantities of Iron for delivery beyond January 1, and next because the majority of buyers have secured all the Iron they will require up to that date. The holiday season will cause at least a temporary cessation from work, and then, too, stock-taking and the general closing up of the year's business will make it desirable to have as small stock on hand as possible. From these facts a steady decline in the demand for Iron is looked for, but in view of the situation which furnacemen occupy there is little or no chance for prices to weaken during this time. Lake Superior Charcoals are now more firm than they have been heretofore, and the demand is considerably stronger for this class of Iron than it was when prices began to react. Buyers apparently are more ready to take hold where they need Iron and are now taking small lots of Nos. 1, 2 and 3 at $19.50, and 4, 5 and 6 at $20, which they refused to buy at 50¢ ℔ ton less 30 days ago. The tendency to weakness on some grades of Coke Iron which was noted last week has been succeeded by a firmer feeling, a portion of which is attributed to the possibility of a strike in the Hocking Valley. Quotations on Coke Iron, All Lake Ore, vary from $18 to $19, the difference, as stated by furnacemen, being in the quality of the Iron. Cinder Mixed is fairly firm at $17 @ $17 50, though the stability of price depends very much upon the proportion of Cinder in the mixture. Ohio Standard Blackband Irons embrace a large number of furnaces and a great diversity in quality as a class. Heretofore we have been quoting $19 @ $19.50 and making special quotations on some of the brands that could not be bought at these figures. Sales agents now claim that the whole line has advanced to $20 for No. 1 and $18.50 for No. 2. This would include Briar Hill, Hubbard, Hazelton, &c., but there are nevertheless some furnaces making this class of Iron that would accept lower figures. The tide having legitimately struck one or two of them, the balance have drifted in, to the extent at least of advancing their asking price, though they may find it necessary to sell at an inside figure. Low Moor has been advanced to $20 for No. 1 and $19 for No. 2. On Southern No. 1 Foundry we quote $18; No. 2, $17; No. 2½, $16; No. 1 Mill, $15, and No. 2, $14.50, these prices being announced as cash on cars here by some of the furnaces, while there are others who would be willing to sell at this price in carload lots, four months. Some of the furnaces are not selling for delivery beyond January 1, while several of the Hanging Rock furnaces have withdrawn all quotations for the next 60 days. Taking the market as a whole, the situation continues to be favorable to the maker, with further indications pointing toward the sustaining of present prices and possibly a further advance before January 1.

Merchant Steel.—Orders during the week have not been large, but the quantity of small ones has greatly improved the market over the week before. Dealers continue to harp on the possibility of getting better figures, but no sales at an advanced price have been made, so far as can be learned. Mills are reported to be well supplied with orders, and some of them to their full capacity. Sales agents claim that the majority of those who have been making a very cheap article are among the number, which in a measure excludes them from the market and makes it possible to obtain better prices on other grades. A nominal quotation on High-Grade Tool Steels is now made from 9¾¢ to 13½¢, and Specials from 15¢ @ 20¢; Ordinary continues to range from 8¢ to 9¢, while on Low Grades 7½¢ has been named; Open-Hearth and Bessemer, 2½¢ @ 3¢; Crucible, 4½¢ @ 5¢; Plow Steels, 5¢ @ 5½¢, the latter being in fairly good demand.

Steel Rails.—The market is quoted firm at $35 @ $37, according to quantity, time of payment and delivery. Inquiries are coming in all the time, and on one lot sold last week it is stated positively that $37 was obtained. Statements are made that Rails are sold for less, but neither buyer nor seller can be discovered. Sales were made previous to November 1 at figures ranging from $32 to $34, and it is possible that quantities have been increased at the same figures, but that new buyers have placed contracts in this market at less than $35 is discredited. Mills are not seeking orders for prompt delivery, and say that they cannot take care of those which are forced upon them.

Structural Iron.—There are no large orders for Structural Iron on the market at present. The usual amount of small trade from store continues to hold out very well, and prices remain unchanged.

Plate and Tank Iron.—Business has been very active. Another advance in freight rates changes quotations from store as follows: Steel Boiler Plate, 3¢ @ 5½¢; Tank Iron, 2.40¢ @ 2.50¢; Flange, do., 4¢ @ 4.10¢; Shell, do., 3¢ @ 3.10¢; Heavy Sheet Iron, Nos. 10 to 14, 2.50¢; No. 16, 2.75¢; No. 18, 2.85¢.

Bar Iron.—The demand holds on very well for the better grades, but no improvement in price has been made. Best Refined New Puddled Iron is quoted at 1.65¢ @ 1.70¢ from mill, and 1.80¢ rates from store. Ordinary Bars and Rail Irons are quoted at 1.65¢ @ 1.70¢ from store, and sold from mill at 1.50¢ rates. It is stated that some of the larger mills showed signs of weakness while searching for orders last week, which dispels all hope of better prices on the balance of this year's trade.

Old Rails.—The demand is considerably in excess of the supply, if the number of transactions can be accepted as a guide. Buyers are quoting $18 @ $18.50, Chicago delivery, but those who have stocks which could be delivered in this city are unwilling to accept the figures. The N. C. R. Co. are quoting $17 @ $17.25, Milwaukee. The Rails they obtain at these figures would not net the seller better prices if sold in Chicago, as the difference would be absorbed in freight and handling.

Black Sheets.—There has been a fairly active demand for Light Black Sheets from jobbers in small lots. We renew quotations as follows: No. 24 at $3.10; Nos. 25 and 26, $3.20, and No. 27 at $3.30. The position of manufacturers is about the same as it has been for several weeks past, most of them being well supplied with orders for this month's delivery. There has been but a light inquiry for December, and very little for January up to the present time.

Galvanized Iron.—Jobbers and dealers report a fairly active trade, though it was in small lots. The work of cornicemen is rapidly drawing to a close, and other lines of consumption, with the exception of furnace manufacturers, are running light. We continue quotations on Juniata 60 % off, and Charcoal 60 and 10 % off, from store.

Old Wheels.—There has been some improvement in the demand, and prices have advanced perhaps 50¢ ℔ ton. Numerous buyers have offered $14.50, and several sales of small lots have been made at this figure. Holders are asking from 50¢ to $1 a ton in advance, and state that they are indifferent about selling at any price. Upon the whole it is possible that Wheels are scarce and regarded as a good investment by those who have the stock.

Scrap Iron.—Dealers report an active demand for No. 1 Forge at $16.50 @ $17. No. 1 Mill is reported steady at $13.50 @ $14, and No. 2 at $8.50 @ $9. Dealers who are pretty well supplied with stock announce the following as their purchasing prices: No. 1 Wrought, $13; Machinery, $12; Stove Plate, $7.50; Steel Tires and Wagon Springs, $12.50; Old Plows and Plow Steel, $9; Wrought-Iron Turnings, $8.50; Cast-Iron Borings, $7.50; Malleable Scrap, $6.

Pig Lead.—The market is quiet. Consumers are taking what they need in small lots at figures ranging from 3.95¢ to 4¢. There is no likelihood of any material change for the better, whereas it is possible that the succeeding dull months for consumers may have a depressing influence. Speculators continue to proclaim the scarcity of Lead, but an attempt to buy speedily reveals the true situation, and, should there be an opportunity to place a round lot, there is no doubt but what present prices would be shaded.

The Myers Mfg. Co., Chicago, have been changed to the George M. Clark Mfg. Co., through the resignation of Mr. Gorson Myers as general manager and the purchase of his interest in the business by the other members of the company. Mr. Clark becomes general manager, Mr. Patton continues in the dual capacity of secretary and treasurer and Mr. Wallace as superintendent. They will continue the manufacture of the Jewel Vapor Stove, and will shortly place on the market a full line of Railroad Lanterns and other specialties.

Chattanooga.

Office of *The Iron Age*, Carter and Ninth Sts., Chattanooga, November 16, 1885.

While there is nothing of a particular nature to call forth special mention in any of the Southern markets, there is no mistaking the signs of the times that the general business of the country is improving, both in tone and volume. The universal opinion as expressed by nearly all the business fraternity is that the country is going steadily forward, and that nearly all well-regulated and economically-conducted enterprises will do well financially and continue to increase, both in the amount of their business and profits, as time passes along. A steady and conservative condition of affairs is what is looked upon by business men as more desirable than all the booms that have ever been originated, and as long as this state of affairs exists there is a certainty of remunerative profits in all manufacturing enterprises. In all lines of manufactured articles prices have within the last three or four months advanced at least 5 % @ 10 %, and, if proprietors lived through the periods of low prices that prevailed some five to ten months ago, the additional profits of the advance ought to be a good assurance of fairly good times in future. In railroading there are no long lines in progress, nor even talked of, but a number of short lines are being constructed, which may be termed "cut-offs" or links to important places, and when completed will aid much in facilitating business. The building of street lines in many of the smaller cities is adding to the demand for Rails and other railroad material.

Pig Iron.—This article has kept pace with all other lines and is moving steadily upward in price. The demand certainly is greater for the past 10 days, and orders are more difficult to place. While there seems to be a little irregularity in the price at which lots are sold, this can be accounted for by some Iron being of inferior grades; then, again, some are not able to hold as long as others and desire to realize; but, taking the market on an averege, there has been an advance of not less than $1 ℔ ton on desirable grades. We note sales of 1500 tons of No. 2½, netting the furnace $12.50, cash, at the furnace, while the Southern market is netting furnaces about $1 ℔ ton more for carload lots. The Chattanooga Furnace will go in blast in a few days, as will also one of the stacks at Dayton. The former has undergone thorough repairs in every respect, and the product will doubtless at once take a prominent place in the market. The Dayton plant, for completeness of details and for convenience of work as well as permanency of construction, is probably equal to any other plant in the United States. Her owners have made arrangements for combining all the different Ores in the district that are necessary to produce the most favorable result, and the output is expected to be among the best grades on the market.

Coal and Coke.—Much more capital and skill are being invested in these interests than ever before. The matter of the quality of furnace fuel is coming to the front more and more every day, and the question of who makes the best Coke for furnaces is answered by that party making sales at good prices for their entire capacity. Several new mines have been opened during the fall, but still the cry is raised in some parts of the South that there is a scarcity of Coal. At the Coal centers—say Chattanooga and Birmingham—the best of manufacturing Coals are being sold at $1 @ $1.50 ℔ ton.

Lumber.—This article of commerce has steadily advanced in price, until now it is only purchased at an advance of 25 % @ 50 % over prices ruling some three or four months ago, and at these prices the mills are under contract for two to six months ahead.

Birmingham.

Birmingham, Ala., November 16, 1885.

In and out of the public prints all over the State industrial or transportation topics of one kind or another happen to be uppermost just now. One of the biggest and decidedly the best advertised thing on the *tapis* is the river and harbor convention to meet at Tuskaloosa to-morrow. The scope of this has been considerably enlarged since it was first projected, and the territory to be represented has widened accordingly. A considerably better attendance is expected now than was promised some two weeks ago. Eads's chief assistant, Captain Corthell, will be one of the speakers. He will talk about the relations of Eads's Tehuantepec ship-railway scheme to the industrial development of this part of the country. The most significant things in news items in the Iron trade here for the last week have been gathered at the foundries and machine shops. Assurances are coming to them from all around that as a manufacturing country this region is making permanent gains on regions further North. Some orders have been received here and at Anniston from car builders who recently moved to Florida from the North for the sake of cheap yellow pine mainly. They have contracted for Wheels from Anniston and Rolled or Wrought Iron in various shapes from here, which materials they have been buying mainly at Wilmington, Del., even since they came South. The main thing, of course, that is controlling such business as this is the advantage manufacturers about here have in the matter of raw material, but assurances of freight rates more favorable to these Southern enterprises have had a good deal to do with this case The difference in price in favor of the home concern is frequently enough of itself. To take, for example, one line that has furnished a good deal of work here of late, C. P. Williamson & Co., of this place, have the contract for the Iron on a new jail here, and in the figures that got it for them they bid some $3000 less than a regular jail concern in Louisville wanted. Information of this fact has helped to bring here other work in the same line, and on these in turn some home shop has beaten somebody further away. R. W. Boland has two such contracts, on one of which his bid was $975 less than a Covington, Ky., concern. Altogether there seems to be more work on hand at the shops than there was a week ago.

Pig Iron.—The conditions of the Coke Iron business here—none of which are new—are not just what the Eastern markets report. If there is a more than proportionally greater inquiry for Mill Irons, it is largely because buyers have found out that they cannot get Foundry grades. Reports come from Anniston of a considerably better demand for Charcoal Iron.

Rolled Iron.—The rolling mills here are as badly pushed by their business as ever. They are as far as 30 days behind on some business that they can take liberties with. Another addition to the plant is contemplated.

Nails—Are in good demand still, but at stationary figures again. Indeed, the Brierfield and Helena mills are billing now at $3, against their quotations of $3.25 a week ago. The more general opinion here now seems to be that prices are more apt to go down than up.

Cincinnati.

November 16, 1885.

Pig Iron.—Quietness has characterized the market in the past week. About the usual amount of business has been done, all goods having been taken for immediate uses. Prices firm at quotations, the better grades leading, of which there is not an over-supply. Quotations below are f o.b. here, or less the freight to Cincinnati, for delivery direct from furnaces. Cash prices are 50¢ ℔ ton less than time quotations:

CHARCOAL FOUNDRY.	
Southern No. 1, 4 mos.	$17.50 @ $18.00
Southern No. 2, 4 mos.	16.50 @ 17.00
Hanging Rock, Best, No. 1, 4 mos.	20.00 @ 20.50
Hanging Rock, Good, No. 1, 4 mos.	19.00 @ 19.75
Hanging Rock, No. 2, 4 mos.	19.00 @ 19.50
COKE FOUNDRY.	
Southern No. 1, 4 mos.	16.50 @ 18.50
Southern No. 2, 4 mos.	15.00 @ 16.50
Ohio and West Pennsylvania, No. 1, 4 mos.	16.50 @ 18.50
Ohio and West Pennsylvania, No. 2, 4 mos.	15.50 @ 17.00
SILVER-GRAY SOFTENERS.	
Hanging Rock (Jackson County), No. 1, 4 mos.	16.50 @ 17.00
Hanging Rock (Jackson County), No. 2, 4 mos.	15.50 @ 16.00
Hanging Rock (Jackson County), No. 3, 4 mos.	15.00 @ . . .
Other makes, Coke and Stonecoal, cash	13.50 @ 14.00
Charcoal, 4 mos.	17.00 @ . . . .
CAR WHEEL.	
Hanging Rock Cold-Blast Charcoal, 4 mos.	23.00 @ 26.00
Hanging Rock Warm-Blast Charcoal 4 mos.	18.50 @ 19.00
Southern Warm-Blast Charcoal, 4 mos.	16.00 @ 17.50
Southern Standard, Warm-Blast Charcoal, 4 mos.	22.50 @ 24.00
Georgia Standard, Cold-Blast Charcoal, 4 mos.	25.00 @ . . . .
FORGE.	
Various grades.	12.50 @ 14.00
SCRAP.	
Rails.	18.00 @ 18.50
Wheels.	14.00 @ . . .
No. 1 Wrought, ℔ 100	.65 @ .70
Country	.60 @ . . . .
Cast, Heavy Machinery	.50 @ .55
Medium and Light	.30 @ .40

Market dull.

Louisville.

W. B. Belknap & Co., Louisville, under date of November 16, 1885, report as follows: There is an encouraging activity still noticeable in almost all branches, and despite the unseasonably warm weather the demand has kept up and jobbers are not complaining unduly. Of course better things are expected for January, just as we look for new calendars and felicitating circulars. The size of the bull movement in New York stocks, however, is as much a mystery as ever before, as it seems incredible that there should be such appreciation of values while Bar Iron remains so nearly at a standstill. Those who are accustomed to figure cost most closely, whose financial needs are not pressing and whose product is not consumed by their own immediate specials, declare that they cannot start up under the present condition of affairs, and claim that it is absolutely necessary that a better price be obtained to enable even the best-equipped mills in the country to run. *Bar Iron.*—As we indicated above, there is no change, and any improvement in the prices is scarcely to be expected before the first of the year. The demand is rather light, as it always is at the close of the season, still enough is being taken into consumption to foster the belief that more will be wanted shortly. *Hoops* and *Bands* are steady at pretty much uniform prices from all the best makers. *Sheet* is jobbing in moderate quantities. The price has gone off to almost the ebb tide figures of last spring. The weather has been so mild that there has not not been that same hurried call for the light gauges as is usual when winter is approaching. *Steel.*—The movement in the various kinds of Steel is fair. A good deal of Tire, Spring and Machinery is finding its way into use, while those engaged in working up agricultural shapes find themselves fully employed, and some have stopped taking further orders altogether. *Nails*—Continue to gather strength as they grow scarcer. The situation is pretty generally accepted by the trade at large, who are buying only for their present wants. No stocks are being carried and no large ones are obtainable. *Wire.*—Syndicate prices are said to be firmly adhered to. Transactions at present seem to be limited, and there is little to gauge the market by one way or another. Unnecessary stress is made on the movements of manufacturers, whether they shut down or start up. The pointer of an industrial nature is seized upon as readily by the ordinary newspaper reporter at present with as much avidity as the latest social scandal. *Ammunition*—Has braced up materially under the fiat of the commissioner, and the whole trade is standing in the attitude of the whistling class who are advised to prepare to pucker. Just what the tune will issue is uncertain. The advance in freight rates is cutting some figure in the situation and giving Western manufacturers, as they formerly had, a decided advantage over the more distant East. General trade is in moderately good shape. Contracts for the coming season are being freely placed, except in certain cases where prices are fictitiously held up by combinations. The bad faith which often characterizes these has gone to beget a distrust in the prices they make, and buyers are weary of placing themselves at the mercy of "resolutions in meeting."

George H. Hull & Co., of Louisville, report to us as follows, under date of November 16, 1885: *Pig Iron.*—The market for Pig Iron is quiet. The recent demand seems to be generally sustained, but there has been a lull in the demand, and sales are consequently light. The market on Mill Irons is in a sensitive state; any considerable demand would advance the price, while any considerable offer would cause a decline. We quote for cash in round lots as below:

PIG IRON.	
Southern Coke, No. 1 Foundry	$16.00 @ $17.00
" No. 2 "	15.00 @ 16.00
" No. 2½ "	14.50 @ 14.75
Hanging Rock Coke, No. 1 Foundry	16.00 @ 16.50
Hanging Rock Charcoal, No. 1 Foundry	19.00 @ 20.00
Southern Charcoal, No. 1 Foundry	17.50 @ 18.50
Silver Gray, different grades	14.50 @ 16.00
Southern Coke, No. 1 Mill, Neutral	14.00 @ 14.50
" " No. 2 " "	13.00 @ 13.50
" " No. 1 " Cold Short	13.50 @ 13.75
Southern Charcoal, No. 1 Mill	15.50 @ 16.50
White and Mottled, different grades	11.50 @ 12.50
Southern Car-Wheel, standard brands	17.00 @ 19.00
Southern Car-Wheel, other brands.	22.00 @ 23.00
Hanging Rock, Cold-blast	17.00 @ 19.00
" Warm-blast	22.00 @ 23.00

A correspondent in Louisville informs us under date of November 16th, that on that day a lot of 1000 tons of Old Rails had been sold there at $19. The asking price now is $20.

St. Louis.

W. H. Shields, 305 Olive street, St Louis, reports as follows, under date of November 16: The market remains quiet, and prices for standard brands are firm, but very little selling. There is little inclination shown either to buy or sell for future delivery.

CHARCOAL FOUNDRY.	
Missouri	$14.50 @ $16.50
Southern	16.00 @ 17.50
COAL AND COKE FOUNDRY.	
Missouri	15.00 @ 16.50
Southern	15.00 @ 17.00
American Scotch	16.00 @ 19.00
MILL IRON.	
Missouri	14.00 @ 14.50
Southern	14.00 @ 14.25
CAR-WHEEL AND MALLEABLE.	
Southern	20.00 @ 24.00
Lake Superior	20.00 @ 23.00
SCRAP, ETC.	
Old Rails	17.75 @ 18.25
Old Wheels	14.00 @ 14.25
Connellsville Coke (East St. Louis).	5.30 @ . . . .

Detroit.

Charles Himrod & Co., dealers in Pig Iron, Detroit, Mich., report, under date of November 16, 1885, as follows: The market for the past week has been unusually quiet. The demand has been less, and consequently sales have been light. The furnaces that recently advanced their prices seem inclined to sustain them, however, and, while most furnaces are sold ahead and are inclined to contract for delivery extending very far into next year, should there be no increase in demand it will be difficult to maintain prices, except on Charcoal Iron, as the demand for that class of Iron is better than for other grades. The demand for Old Material is steady, with very little change in prices. For round lots on four months' time we present the following:

Lake Superior Charcoal, Nos. 1, 2 and 3	$19.75 @ $20.25
Lake Superior Charcoal, Nos. 4, 5 and 6	20.00 @ 21.00
Lake Superior Coke, All Ore	19.50 @ 20.00
Lake Superior Coke, Cinder Mixed.	17.50 @ 18.00
Standard Ohio Blackband	19.50 @ 20.00
Southern No. 2	17.00 @ 17.50
Southern Silvery, Open	16.50 @ 17.00
Southern Silvery, Close	16.00 @ 16.50
Jackson County (Ohio) Silvery	18.00 @ 18.50
No. 1 Southern Mill	14.25 @ 14.75
Old American Iron Rails	19.00 @ 20.00
Old Wheels	15.75 @ 16.50

The plant of the Huntingdon Car and Wheel Works, in Pennsylvania, was sold on the 16th inst. to Percival Roberts, of Philadelphia, for $20,000. Excepting the shops of the Pennsylvania and the Reading railroads, they are second to none in the State, and are estimated to be worth from $150,000 to $200,000.

Trade Report.

General Hardware.

There is but little change in the volume of business, of which a fair amount is doing. Reports from the Hardware centers of the interior indicate in most cases a satisfactory condition of trade and the prevalence of a good feeling as to the future outlook. There is, however, little disposition to buy in advance of present requirements. Prices, as a rule, are firm, but the danger is recognized that in the dull season at hand manufacturers may be disposed to shade present quotations for the sake of inducing orders. It is, however, to be hoped that a wiser and conservative policy will prevail.

BARB WIRE.

The market has been quiet and dull, with nominal quotations of Four-Point Galvanized Barb Wire at 4.35 to 4.40 cents for carload lots, and small lots at 4.50 cents. At a meeting held at Cincinnati last week five works, located in St. Louis, Cincinnati, Pittsburgh and Joliet, made an agreement, backed by a money forfeit, not to sell Barb Wire at St. Louis, Louisville and Indianapolis at less than 4.25 cents. Reports to the Associated Press are to the effect that yesterday a meeting of manufacturers agreed to a pool, restricting production, distributing the make pro rata, and thus bringing about better prices.

NAILS.

On Thursday last the Nail trade in this city and in Philadelphia met in conference to discuss the situation. While no advance was officially decided upon, the result of the exchange of ideas led to the general adoption of the $2.75 base, with the usual discount to the trade. That price has since prevailed. The conditions affecting the market here remain practically the same—a moderate demand, inadequate supply and no stocks. The following review clearly represents the state of affairs in the West:

Since we last reviewed, editorially, the labor situation in the Nail mills of the West several events have occurred which, though of but little importance by themselves, taken in connection with their surroundings are of more than usual significance. One mill—the Waugh—has resumed, under agreement with the Nailers' Association. This makes the mills running in the West in the old way with their old nailers as follows: Bellaire, Ohio; Etna, New Castle, Pa.; Kimberly, Sharon, Pa.; Greencastle and Aurora, Ind.; Centralia and Belleville, Ill; Omaha, Neb., and Pueblo, Col. These have 481 machines. On the other hand, according to the last report of the secretary of the Western Nail Association, there are now running at the manufacturers' scale and in opposition to the orders of the Nail association the following machines: Belmont Nail Co., November 10, 92; Laughlin Nail Co., November 10, 86; Kelly Nail and Iron Co., November 7, 67; Belfont Iron Works Co., November 7, 80; Norton Iron Works, November 7, 75; Riverside Iron Works, November 10, 42; Wheeling Iron and Nail Co., November 10, 48; Western Nail Co., November 9, 40; La Belle Iron Works, November 10, 26. Terre Haute Iron and Nail Co., November 7, 2. This shows a total of 558 machines, and is an increase of 21, compared with the report of the previous week. The report of the present week, which has not been published as we write, will show fully as decided an increase as the previous week. Indeed, a report comes from Wheeling that one of the lodges of the Nail Feeders' Union, which have all along held out firmly with the Nailers for a 21-cent scale, had rescinded all their former resolutions on this subject and formally disbanded. Whether this is a fact or not, it is true that members of the lodge referred to have abandoned the organization and accepted machines to run at the 17-cent or manufacturers' scale. The number of members of the feeders' unions who in spite of all opposition have taken jobs shows a tendency on the part of the feeders to break away from the nailers, which the latter as a class refuse to believe is possible. At the meeting of the Western Nail Association, held in Cincinnati on the 11th, to which we referred in a brief telegram in our last issue, a communication was received from M A. Chew, secretary of the United Nailers', Heaters' and Rollers' Association, as follows: "I am authorized by our Executive Board to notify you officially that they have a conference committee and are willing to meet a committee from the association of which you are secretary at any time and place you may name"

It will be noted that this does not ask for a conference, but simply expresses a willingness to have one. But even in this form it is a decided change of attitude on the part of the Nailers' Association, who have heretofore refused practically to meet the manufacturers. In answer to this communication from the nailers, the following resolution was adopted, which, as it will be noticed, reaffirms the position the manufacturers have heretofore taken:

Resolved, That under ordinary circumstances the Western Nail Association would not hesitate to enter upon negotiations, but the necessity forced upon us by the United Nailers of America in the early part of this controversy, of employing a new set of workmen, and our obligations to these "new nailers" are such that we could not entertain an proposition that would interfere with these obligations; we therefore decline to enter upon negotations with the United Nailers of America, but assure all competent nailers everywhere that, so far as we have machines in our several mills to give, they will be given to such nailers and feeders who desire to become nailers as may be willing to accept the manufacturers' scale and work with and on the same conditions as our present workmen.

In addition to this the indications are that Nails are not in as short supply as they were a few weeks ago. The highest prices reached are by no means maintained. Jobbers and consumers do not now have to beg for Nails, but the mills are sending out their offers, and, as is above stated, these are at rates that would not have been accepted three or four weeks ago. Indeed, the Nail famine is well nigh over, and, though there is by no means a plethora of Nails, yet there seems but little difficulty in obtaining all that are needed, though not enough to enable jobbers and consumers to carry stocks for speculation. On the whole the drift of affairs is in favor of the manufacturers. Possibly the striking nailers will hold out for months yet, but the indications are that the manufacturers will supply their places with feeders who in the near future will be able to perform their work in a satisfactory manner, and that 17 cents will be the price for cutting Nails in the West. This brings up the question as to what the Eastern mills will do. Under the stimulus of the demand and the advance in prices, which many of the Eastern mills regarded as unwise, the nailers in the East secured an advance of 1½ cents, and at many mills 16½ cents is paid for cutting—that is, within ½ cent of what the manufacturers demand in the West. Should the Western mills succeed in securing their work done at 17 cents, then the question will arise as to the price to be paid in the East. There always has been much more of a difference than ½ cent, and no doubt the manufacturers will demand a reduction to at least the price that was ruling before the advance, if not a still lower one. When 21 cents was the price in the West, just prior to the strike, the Eastern mills were paying from 14 to 15 cents—say, 6 cents less a keg. Will they insist upon this difference when the Western manufacturers secure the 17-cent rate, and if they do, or a reduction somewhat in accordance with the differences that have heretofore existed, can it be secured without a strike?

WIRE NAILS.

The manufacturers of Wire Nails held another meeting last week, most of the prominent houses in this line being present. G. B. Germond, of the Russell & Erwin Mfg. Co., was chosen president, and M. Baaches, of the HP Nail Co., Cleveland, secretary. Action was taken revising the list and advancing the price, as stated below.

The list, which has long been in use, was made when the sale of Wire Nails was unimportant in comparison with the present extent of the trade, and contained many inequalities, so that the prices for the different sizes did not fairly represent the cost of making the goods. The importance of revising it was therefore recognized, and the new list given in another part of this page was adopted. Revised lists of Brass Escutcheon Pins and Iron Escutcheon Pins were also adopted, and are printed herewith. A uniform discount of 50 and 10 per cent. applies to all these lists. The following additional specifications were also determined upon:

Barbing, 1 cent per pound advance on list.
Special Heads, 1 cent per pound advance on list.
Special Points, 1 cent per pound advance on list.
Nails combining two of the above specialties, 2 cents per pound advance on list.
Nails combining above three specialties, 3 cents per pound advance on list.
Nails packed in ½-pound papers, 1 cent per pound net extra.
Nails packed in ¼ pound papers, 2 cents per pound net extra.
For tinning or galvanizing add 50 per cent. to list prices.

The trade will recognize the propriety of the action thus taken and will note with gratification the concerted action of the manufacturers in putting this increasingly important line on a satisfactory basis.

The following manufacturers were represented in the above action:

HP Nail Co., Cleveland, Ohio.
Hartman Steel Co., Beaver Falls, Pa.
American Wire Nail Co., Covington, Ky.
Russell & Erwin Mfg. Co., N. Y.
A. Field & Sons, Taunton, Mass.
Dunbar, Hobart & Whiddon, South Abingdon, Mass.
American Tack Co., Fair Haven, Mass.
Wire Goods Co., Worcester, Mass.
Pennsylvania Tack Works, Norristown, Pa.
William Hassall, New York.
Brooklyn Wire Nail Works, A. R. Whitney & Co., New York.
Phillips & Townsend, Philadelphia, Pa.
Standard Nail Co., Detroit, Mich.
Otto Richter, New York.
Indianapolis Wire Nail Works, Indianapolis, Ind.
Salem Wire Nail Co., Salem, Ohio.
E. Phillips & Sons, So. Hanover, Mass.
Samuel Loring, Plymouth, Mass.

It is understood that the American Screw Co. and other manufacturers will adopt the new lists and adhere to the prices as stated above.

NEW WIRE NAIL LIST.

November 11.

In.	Wire 00 Gauge.	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	Wire 22 Gauge.	In.
⅛	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	70	80	100	⅛
¼	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	27	28	30	32	35	40	50	60	80	¼
⅜	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	21	21	22	23	24	25	26	27	30	35	40	50	60	⅜
½	.....	.....	.....	.....	.....	.....	18	18	18	18	18	19	19	19	20	21	22	23	24	26	30	35	40	50	½
⅝	.....	.....	.....	.....	.....	.....	17	17	17	17	17	18	18	18	19	19	20	21	22	24	26	30	35	50	⅝
¾	.....	.....	.....	.....	16	16	16	16	16	16	16	17	17	17	18	18	19	19	20	22	23	27	35	55	¾
⅞	.....	.....	.....	.....	15	15	15	15	15	15	15	16	16	16	17	17	18	18	19	20	23	27	37	.....	⅞
1	.....	.....	14	14	14	14	14	14	14	14	14	15	15	15	16	16	17	17	18	20	24	28	40	.....	1
1⅛	.....	.....	13	13	13	13	13	13	13	13	13	14	14	14	15	15	16	16	17	20	24	28	.....	.....	1⅛
1¼	12	12	12	12	12	12	12	12	12	12	12	13	13	13	14	15	15	16	17	21	24	30	.....	.....	1¼
1½	11	11	11	11	11	11	11	11	11	11	11	12	12	12	13	14	15	16	17	21	25	.....	.....	.....	1½
1¾	11	11	11	11	11	11	11	11	11	11	11	11	11	12	13	14	15	16	18	22	.....	.....	.....	.....	1¾
2	10	10	10	10	10	10	10	10	10	10	10	11	11	12	13	14	15	16	19	23	.....	.....	.....	.....	2
2¼	10	10	10	10	10	10	10	10	10	10	10	11	11	12	13	14	15	17	.....	.....	.....	.....	.....	.....	2¼
2½	10	10	10	10	10	10	10	10	10	10	10	11	11	12	13	14	16	.....	.....	.....	.....	.....	.....	.....	2½
2¾	10	10	10	10	10	10	10	10	10	10	10	11	11	12	13	15	.....	.....	.....	.....	.....	.....	.....	.....	2¾
3	10	10	10	10	10	10	10	10	10	10	10	11	11	12	14	.....	.....	.....	.....	.....	.....	.....	.....	.....	3
3½	10	10	10	10	10	10	10	10	10	10	10	11	11	13	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3½
4	10	10	10	10	10	10	10	10	10	10	10	11	11	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4
4½	10	10	10	10	10	10	10	10	10	10	10	11	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4½
5	10	10	10	10	10	10	10	10	10	10	10	11	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	5
6	10	10	10	10	10	10	10	10	10	10	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	6
7	10	10	10	10	10	10	10	10	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	7
8	10	10	10	10	10	10	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	8
9	10	10	10	10	10	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	9
10	10	10	10	10	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	10
11	10	10	10	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	11
12	10	10	10	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	12

TACKS.

The Associated Tack Manufacturers adopted yesterday the following revised discounts, to apply to the "Hardware List of Prices" dated September 1, 1882, and "Supplement" dated January 1, 1885, there being the usual additional discount of 10 and 2 per cent. for cash:

	Discounts.
American Iron Carpet Tacks, all kinds	60 %
Steel Carpet Tacks, all kinds	55 %
Swedes Iron Carpet Tacks, all kinds	55 %
Swedes Iron Tacks	55 %
Swedes Iron Upholsterers' Tacks	55 %
Tinned Swedes Iron Tacks	55 %
Tinned Swedes Iron Upholsterers' Tacks	55 %
American Iron Cut Tacks	55 %
Gimp and Lace Tacks	50 %
Tinned Gimp and Lace Tacks	50 %
Copper Tacks	50 %
Copper Finishing and Trunk Nails	50 %
Cigar Box Nails	45 %
Finishing Nails	45 %
Zinc Glaziers' Points	45 %
Common and Patent Brads	45 %
Hungarian Nails and Miners' Tacks	40 %
Trunk and Clout Nails	37½ %
Tinned Trunk and Clout Nails	37½ %
Basket Nails	37½ %
Chair Nails	37½ %
Tinned Capped Trunk Nails	30 %
Looking-Glass Tacks	25 %
Picture Frame Points	25 %
Leathered Carpet Tacks	25 %
Brush Tacks	25 %

For Tinned and Coppered Goods on Hardware List for which prices are not given, add 6 cents per pound.

The following revised Shoe Finders' list is also issued, bearing date November 18th, which is subject to the discount of 10 and 2 per cent. for cash:

	Per pound.
Iron Shoe Nails, 4-8 inch and longer	5½¢
Iron Shoe Nails, 3½-8 inch and shorter	6½¢
N. B. Shoe Nails	6½¢
Swedes and Charcoal Iron Shoe Nails	7½¢
Zinc Shoe Nails	9½¢
Zinc Shank Nails	18¢
Diamond Head Zinc Nails, 2-8 & 2½-8 inch, 30¢; 3-8 inch, 24 ¢; 3½-8 inch and longer	20¢
Copper Shoe Nails	34¢
Brass Shoe Nails	21¢
Copper Gimp Nails or Tacks	44¢
American Iron Hungarian Nails, 2-8 & 2½-8 inch, 15¢; 3-8 & 3½-8 inch, 13¢; 4-8 inch and longer	12¢
Swedes Iron Hungarian Nails, 2-8 & 2½-8 inch, 16¢; 3-8 & 3½-8 inch, 14¢; 4-8 inch and longer	13¢
Swedes Iron Hungarian Nails (Fancy Head), 2-8 & 2½-8 inch, 19¢; 3-8 & 3½-8 inch, 17¢; 4-8 inch and longer	16¢
Oval Head Shank Nails or Tacks, 2-8 & 2½-8 inch, 32¢; 3-8 & 3½-8 inch, 24¢; 4-8 inch and longer	19¢
Hob Nails, Swedes Iron, all sizes, 10¢ per pound, in pound or ½-pound papers.	
Hob Nails, American Iron, all sizes, 8¢ per pound, in pound or ½-pound papers.	
Steel Shoe Nails, all sizes, 14¢ per pound, in pound or ½-pound papers.	

Steel Shoe Nails.

Inches	4-8 and shorter.	5-8	6-8 and longer.
Cents per M.	$0.22	.28	.32

Channel Nails.

Inches	2½-8	3-8	3½-8	4-8
Cents per pound.	$0.48	.29	.25	.22

Inches	4½-8	5-8 and longer.
Cents per pound	$0.20	.18

Shoe Tacks.

Ounces	½	¾	1	1¼	1½
Cents per pound.	$0.75	.55	.36	.29	22
Cents per M.	0.3	.3	.3	.3	.3
Ounces	2	2½	3	4	
Cents per pound	$0.20	.17	.16	.14	
Cents per M.	0 3	.3	.3½	.4	

Miners' Tacks.

Inches	3-8	3½-8	4-8 and longer.
Cents per pound	$0.15	.13	.11

Countersunk Swedes Nails.

Inches	3-8	3½-8	4-8 & 4½-8	5-8 & 5½-8
Cents per pound.	$0.32	.25	.22	.19

Inches	6-8	7-8	8-8 and longer.
Cents per pound	$0.17	.15	.13

Concave and Countersunk Head Brass Nails.

Inches	2-8 & 2½-8	3-8 & 3½-8	4-8 and longer.
Cents per pound.	$0.31	.26	.24

Concave and Countersunk Head Copper Nails.

Inches	2-8 & 2½-8	3-8 & 3½-8	4-8 and longer.
Cents per pound.	$0.35	.31	.29

Iron Gimp Nails.

Inches	2½-8	3-8	3½-8	4-8
Cents per pound	$0.46	.32	.29	.24

Inches	4½-8	5-8	5½-8	6-8 and longer.
Cents per pound.	$0.22	.20	.19	.18

Any of the above kinds Tinned, price not specified, 5 cents per pound advance on above prices.

The trade will notice with interest the advance thus made, which is referred to by the manufacturers as called for by the very close figures at which most of the leading goods have been sold. It remains to be seen whether the outside makers will announce a corresponding advance.

CORDAGE.

The following revised price list of Cordage has been issued, under date of November 11, in which it will be seen that a reduction of ½ cent per pound is made in the price of Manila Rope. The list is subject to the usual discount to the trade of 1 cent per pound:

Manila Rope.	Cts. per lb.
1¼ inch cir. and upward	13
12 thread, or ⅜ inch diameter	13½
6 and 9 thread, or ¼ and 5-16 inch diameter	14
Hay Rope, 2, 3, 4 or 5 thread	13
Bolt and Point Rope	14½
Tarred Rope and Lath Yarn	12½
Stave, Leather and Hop Twine	13½

IRON ESCUTCHEON PINS.

November 11, 1885.

Gauge	3-16	¼	5-16	½	5-8	¾	7-8	1	1⅛	1¼	1½	1¾	2
10	.....	.....	25	23	22	21	20	19	18	17	16	15	15
11	.....	.....	26	24	23	22	21	20	19	18	17	16	16
12	.....	.....	27	25	24	23	22	21	20	19	18	17	17
13	.....	.....	28	26	25	24	23	22	21	20	19	19	19
14	40	33	30	28	26	25	24	23	22	22	21	21	21
15	45	35	32	30	28	27	26	25	24	24	24	24	24
16	50	40	35	32	30	28	27	26	26	26	26	26	27
17	55	45	37	34	32	30	29	28	28	28	28	29	30
18	60	50	40	36	34	32	30	30	32	34	33	35	
19	70	55	50	45	40	35	35	38	38	38	40	.....	.....
20	85	65	55	50	45	40	40	45	45	45	.....	.....	.....
21	100	80	70	60	55	55	60	60	.....	.....	.....	.....	.....
22	125	100	85	70	65	70	.....	.....	.....	.....	.....	.....	.....

BRASS ESCUTCHEON PINS.

November 11, 1885.

Gauge	3-16	¼	5-16	½	5-8	¾	7-8	1	1⅛	1¼	1½	1¾	2
10	.....	.....	75	73	72	71	70	69	68	67	66	65	65
11	.....	.....	76	74	73	72	71	70	69	68	67	66	66
12	.....	.....	77	75	74	73	72	71	70	69	68	67	67
13	.....	.....	78	76	75	74	73	72	71	70	69	69	69
14	90	83	80	77	76	75	74	73	72	71	70	70	70
15	95	85	82	78	77	75	75	74	73	72	72	72	72
16	100	90	85	82	80	78	76	75	74	74	74	74	75
17	110	100	92	89	87	85	83	81	80	80	80	81	82
18	120	110	100	96	94	92	90	90	90	92	92	93	95
19	135	120	115	110	105	100	100	103	103	103	105	.....	.....
20	155	135	125	120	115	110	110	115	115	115	.....	.....	.....
21	175	155	145	135	130	130	135	135	.....	.....	.....	.....	.....
22	200	175	160	145	140	145	.....	.....	.....	.....	.....	.....	.....

Sisal Rope.

1¼ inch cir. and upward	9
12 thread, or ⅜ inch diameter	9½
6 and 9 thread, or ¼ and 5-16 inch diameter	10
Hay Rope, 2, 3, 4 or 5 thread	9
Tarred Rope	8½
Lath Yarn	8

Russia Hemp.

White Rope	17
Tarred Rope and Ratline	11
Spun Yarn	10½
Bolt Rope	18
Marline, Houseline, Rounding and Hambroline	15
Packing	16

American Hemp.

White Rope	18
Tarred Rope and Ratline	12½
Spun Yarn	12
Lath Yarn	12½
Packing	17
Marline, Houseline, Rounding and Hambroline	16
Sash and Bell Cord	25 to 35

Italian Hemp.

Packing	20
Tarred Rope	16

Jute.

Rope and Packing	8

Oakum.

Best Oakum	8
U. S. Navy	7¼
Navy	6¼

Discounts to Dealers.

On 100 bales and over	½

ITEMS.

The market for Cast Butts is firmer than it has been, some of the manufacturers asking slightly advanced prices, but the jobbers have not generally made a corresponding change in their quotations.

The Nail Sets illustrated among the Hardware Novelties on page 31, manufactured by C. S. Bellamy & Co., Newark, for whom Sise, Gibson & Co. are agents, 100 Chambers street, New York, are sold at the following list prices, subject to a discount of 50 per cent:

¼-inch per gross	$13.50
5-16-inch per gross	14.50
Assorted per gross	14.00

There are rumors of an effort to strengthen the price of Hoes, which, as the trade are aware, have for a long time been very low, but with what prospect of success cannot yet be learned.

The Elmwood Tool Co., 47 Sprague street, Providence, R. I., issue circulars relating to their Repoussé Tools and Screw Drivers. They call attention to their outfit of Tools for repoussé work, consisting of six Steel Tools (two Tracing and four Matting), Wood Stand for the Tools, Small Hammer, Screw Driver, Set of Screws (to hold the work in place), Simple Sheet of Designs, Instruction Book, supply of Sheet Brass, and Carbon Paper (for tracing designs), which are put up in a neat box. They are sold at $21 per dozen, with a discount of 33⅓ per cent. in gross lots and of 40 per cent. discount in five gross lots and over. Their Screw Drivers are sold from the following price list, at discount of 25 per cent:

	Per gross.
3-inch H. P. Screw Drivers	$10.00
4-inch H. P. Screw Drivers	12.00
5 inch H. P. Screw Drivers	14.00
6-inch H. P. Screw Drivers	16.00
7-inch H. P. Screw Drivers	18.00
8-inch H. P. Screw Drivers	20.00

The I. F. Bloodgood Co., Williamsport, Pa., for whom John H. Graham & Co., are agents, 113 Chambers street, New York, and who in their announcement on page 8 call attention to their line of Sand and Emery Paper, &c., in addition to their regular goods have added Garnet Paper, for which special durability is claimed. They have also lately increased their facilities for the manufacture of their goods.

In their advertisement on page 10 our readers will observe that Robert M. Diaz & Co., Boston, call attention to their Halifax Pattern German Acme Club Skate, and announce that they have a full stock of all sizes. As seasonable goods this intimation may be of interest to the trade.

The Bridgewater Iron Co., 73 Pearl street, New York, issue, November 16, a circular announcing the following new price list of Bridgewater Horse Nails, from which a discount of 30 per cent, is announced:

Nos.	5	6	7	8	9	10
Price per pound.	28c.	25c.	23c.	22c.	21c.	20c.

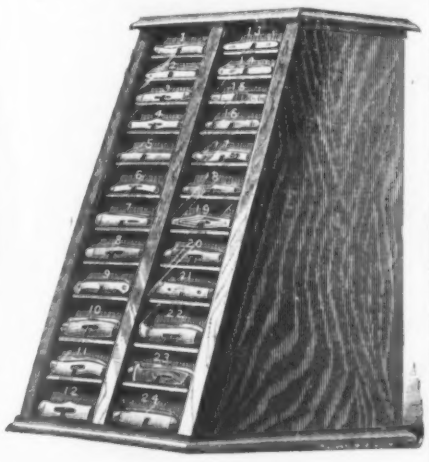
In the many letters which we are receiving from Hardwaremen in all parts of the country relating to topics discussed in our columns, fluctuations in prices and other matters of trade interest, we are glad to notice a very general reference to the satisfactory condition of business. It is evident that a fair retail trade is doing, and the manner in which our correspondents allude to the condition of business and the outlook indicates a healthy state of affairs.

A. H. Dodd, Hudson, N. Y., issues a circular describing the Little Gem Window Blind Worker, to which we have before referred, and which is intended to retail at 75 cents per pair, the trade discount being 33⅓ per cent. on 12 pairs, 40 per cent. on 100 pairs, with 5 per cent. additional discount for cash with order.

Grove, Grier & Co., 330 Walnut street, Philadelphia, and Danville, Pa., issue a circular relating to their Steel Washers and referring to their special features and advantages. It is claimed that they are stiffer, flatter and more evenly engaged than Iron Washers, while sold at the same price. The point also is made that because they are stiffer than iron when used against wood or other soft substances they bear evenly on all points, thus distributing the strain and avoiding the liability of buckling up. Their greater durability is also alluded to, and the fact that they are not so liable to heat in use.

ARRANGEMENT OF HARDWARE STORES.

In the illustration given below we represent the Vrooman Combination Stock and Sample Case, on which a patent has just been granted to J. R. Torrey & Co., Worcester, Mass., and which is intended to serve as a combined show and stock case for Pocket Cutlery, Razors and other small articles. It consists of a series of drawers, numbered correspondingly in front and rear, so arranged as to hold sample on the front end of drawer under and close to the glass

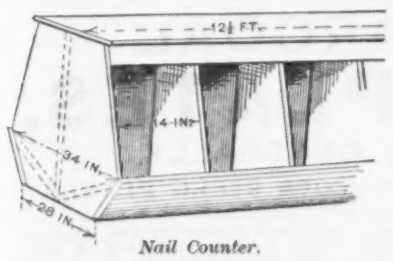


Pocket Cutlery Case.

front, the rest of the drawer being of size sufficient to contain one dozen of the Knives so sampled. The rear of the case is closed by double doors. The dimensions of the case shown are as follows: Hight, 14 inches; base, 11 inches square, a size which is described as sufficient to hold 24 dozen Knives. Larger cases, we understand, will be made, holding 48, 72 and 96 samples, and carrying a corresponding number of dozens of the same. Ninety-six samples and stock of one dozen each can be contained in a case 45 inches long, 12 inches wide and 14 inches high. Razor Cases will also be made showing eight and 16 samples, with a similar provision for stock. Among the advantages which are mentioned in connection with this arrangement are economy of space, which is apparent from the above statements, and the prominence with which a dealer's complete line of Knives is placed before his patrons. The fact that the samples are thus kept out of danger of rust and free from dust will also occur as a point in favor of this compact case, as well as the ease with which it can be transferred from one part of the store to another, or placed in the show-window.

The following letter describing a Nail Bin is from a well-known and experienced Hardwareman, whose suggestions in regard to this matter will be of service to the trade:

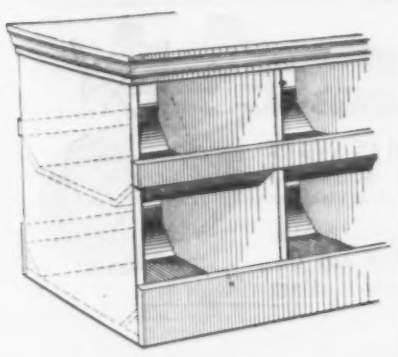
Allow me to give you a description of what I use for handling Nails at retail. The top of the counter is 28 inches wide and its



Nail Counter.

length 12½ feet. A strong partition runs the whole length in the center of the counter to the under side of the top, with 10 Nails Bins on each side of the counter running to the center, the opening of each being 14 inches. The bottom of the bins is 8 inches from the floor in front and runs downward on an incline, until where the bottom reaches the center of the counter it is about 1 inch from the floor. A 3-inch board that runs the whole length of the counter under the top and nailed to the partitions of each bin gives a convenient place on which to mark the size of Nails contained in the different bins. The scales are placed on the counter, which is used for general purposes, the same as any in my store.

The arrangement used by another house for handling Nails is shown in the following diagram, which, without detailed explanation, will be understood. Our correspondents,



Nail Counter.

in sending it, remark that there may be better, but this is the best they have been able to do. Suggestions for Nail Bins and Counters are in order.

The following communication from a house in Ohio goes with some detail into the arrangement of the store, and will doubtless give some points of interest:

To the Editor of The Iron Age: We have been studying the problem how to show stock in the most attractive manner and how to arrange it so as to enable the least amount of help to sell the greatest quantity of goods. For this purpose we would arrange to have on one side—the right—for about 12 feet a glass showcase against the wall, not less than 6 feet high, and in it would put hooks and pins upon which to suspend Saws and various fine Tools. On the balance of the side we would put shelving 12 inches deep, filled with boxes of suitable size, painted green and sampled with contents, or labeled with an illustration of contents. Would make counter shelf 30 inches deep, and below it would put drawers that are deep enough to take Saws in lengthways. Augers and Chisels should be put in drawers sufficiently large to hold a dozen of a kind, and plainly marked, so that the customers can know what they contain. For Auger Bits a chest of drawers like a spool case, with divisions in drawers to separate the kinds and sizes, will be found very convenient. This case is most conveniently placed on the counter shelf. All the long goods which take up so much room when laid lengthways are better to be placed endways. It is very easy to put a picture on the outside of the box, and pictures do not rust. Above the drawers fill in with boxes of sizes suitable to hold the various little articles of Tools. Then put Locks in boxes and sample each box, and on the balance of that side put such goods as are best shown over the counter.

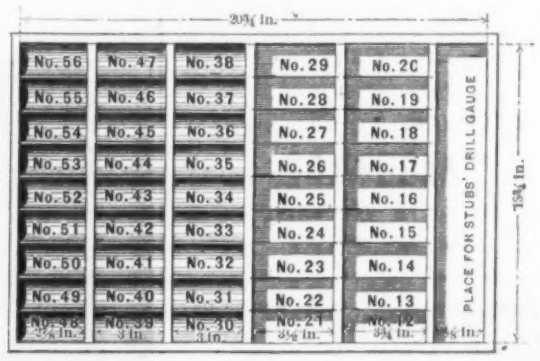
Have counters on one side only if the store is narrow or not more than 20 feet wide. Under the counters fill in with drawers for Brushes and other goods that are best kept cool. Where counters are not covered with showcases let the top be of plate glass to show the contents of the first tier of drawers. A case 3½ feet long and as wide as the counter and 12 inches high will show a fine line of Pocket Knives. Make the top of plate glass and put a shelf to cover the entire case 2 inches from top. Cover with green cloth; label each Knife with number and price. Below shelf have two rows of drawers in which to put the Knives in the boxes as they come from factory, numbered as the samples are, and sell from the box, leaving the sample until last. Hang the top of case on hinges and lock it. Keep Rope in cellar, with the ends coming through the floor and counter where they can be seen. The Nails keep under counter in bins. Fifteen-inch is all the space necessary for the sizes from 3d. fine to 10d. Just opposite have a two-story counter. It will be a little high, but one that will hold 40 kegs of Nails will occupy a floor space of 20 x 2 feet. A space 16 inches high, 15 inches wide and 24 inches deep, with slanting bottom to the center, will hold a keg of Nails easily. Let the openings of bins face the center of the room, and put Scales on lowest counter. On the back of the two-story counter, which should be solid, make a place 2 feet high, 2¼ inches deep and as long as necessary, to hold stock of Squares. Put in bins or cornice hooks to hold the different kinds, and cover the place with a door hung at the bottom and held closed at the top with cupboard catches.

If Paints are carried in stock arrange shelving so that the cans will fit in about two high. This will be on the left as you enter store. Then fill in the balance of 12 feet shelving with boxes to hold Cornice Hooks, Cupboard Catches, Sash Lifts, Sash Fasteners and that class of goods. At the end of this section put a File case. A case 30 inches long, 22 inches high and 20 inches deep, with 10 drawers divided in three sections, will hold 30 kinds of Files. Beyond the Files arrange the Screws in boxes to hold two kinds in a box. Keep the sizes in boxes so different that there will be little liability to mix them, and if mixed that they can be easily separated. Butts are best kept in the paper boxes they come in, next to the Screws on the counter ledge, which should be at least 25 inches wide. The first shelf above the ledge could be up, say, 15 inches, and that would give room to put each size by itself. Under the counter ledge a row of drawers for Hatchets, Adzes, Trowels, &c. For Sand Paper a case of shelves divided so as to hold a ream of each, put on the end of high counter. For Crosscut Saws make a box 30 inches wide, 7½ feet long and 10 inches deep. About 15 inches from bottom put a piece of board cut with gains ½ inch apart, and 5 feet from the bottom put another cut in the same way. This will keep saws apart. Cover with doors to keep out dust. Let box lean against the wall, so that it will keep its position. For Wire Cloth take two pieces of wood 2 x 4, 6 feet long, and fasten together so that they will be 42 inches apart at bottom and 26 inches apart at top; bore holes 12 inches apart and put in rollers; slide your Wire Cloth on these rollers, so that, when cloth is wanted, by pulling on the end of roll it will revolve and unroll.

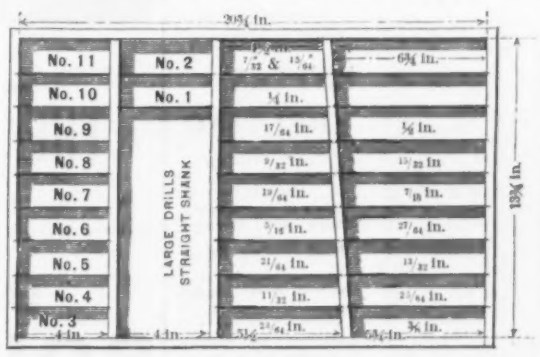
A section of 8 feet long and 15 inches deep divided into compartments will hold Strap and T and Screw and Strap Hinges. Three feet high will be enough. Then above this put in a case of boxes to hold Bolts and Lag Screws. A case 3 feet wide and 4 feet high, with a stickful of pins to separate the points of Scythes and a piece of wood near the top on which to rest the heel, will hold 60 Scythes. Such a case closed with doors will keep the goods in nice shape out of season. For Dry Colors, Ochers, Umbers, &c., use a box of bins with covers. A good Glass table may be made 3 by 5 feet, with a piece of wood screwed on each end and projecting above the table ¼ inch; table divided into inches by lines drawn across it; a receptacle below for broken glass. Case for Glass: Make a shelf 4 inches high and 30 inches deep. On this make a series of partitions 3 or 4 inches apart and as high as the Glass is long. The divisions for smaller sizes should hold a little more than a box, and they can be three tiers high, the larger sizes being two tiers high. On the side of the store on which there is no counter put goods that do not require much showing. Oil, Varnish, Turpentine and such like goods should be kept in tanks air tight. It is convenient to have a rack suspended from the ceiling upon which to hang articles—½-inch gas-pipe with a 3½-inch screw welded in one end and thread cut on the other end, and couplings (T-joints) screwed on; then connect the suspended pieces by other pieces of gas-pipe and you have a good place to hang a variety of goods. We find that to pile away Nails in the center of the cellar, each size by itself, using the side walls for Glass in boxes, which we put on shelves, and for other heavy goods, gives us the best satisfaction.

From Larrabee & Barnes, Amsterdam, N. Y., we have the following suggestions and sketches relating to a Twist Drill Case, which may be of service to some of our readers as giving a simple and apparently satisfactory contrivance for this purpose:

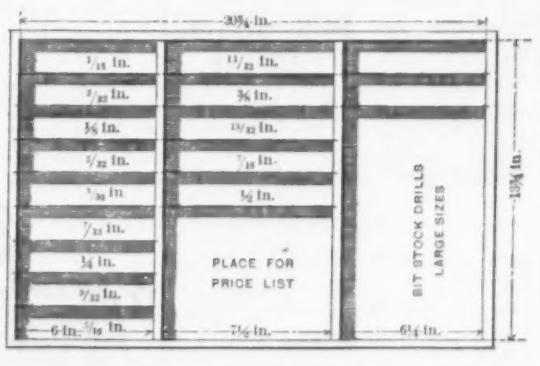
In reply to your inquiries as to the arrangement of Hardware, we have to offer these sketches of our Twist Drill Case, which is a Coat's Six-Drawer Thread Case, with the original partitions taken out and others put in, as indicated. The drawers are 2 inches deep. The different sizes are separated by a piece of IX tin, the ends of which are let into the wood, making partitions 1½ inches apart. These pieces of tin are not quite as deep as the drawer, neither are the



Drawer No. 1, Top.—Straight Shank Drills.

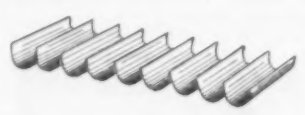


Drawer No. 2.—Straight Shank Drills.



Drawer No. 3.—Bit Stock Drills.

wooden partitions, and we thus have room to cover up the ends of the tins with a thin wooden strip which holds them down, and on which are the figures denoting the size of Drill in each section. In three sections in drawer No. 1, which contain the smallest Drills, we have placed a piece of tin the full width and length of the section and formed thus, which makes it an easy matter to get



the Drills out, as it leaves no corners in which they can hide. The Drills in the other sections are large enough so that they are not liable to get lost in the corners. Drawers Nos. 2 and 3 are also represented, showing manner of utilizing the space in the corners. The other three drawers of the case we use for small Drills, Needles, &c. This case is cheap, and, so far as our wants go, it "fills the bill."

A wholesale and retail dealer in Hardware and Agricultural Implements thus refers to the general subject and the room there is for improvement in many stores:

I have read with interest the various plans presented in your columns for the arrangement of Hardware stores, and have no doubt that the result will be beneficial to the trade. However, I do not think any general plan could be adopted except by those contemplating the building of new storerooms. The great question with the trade at present is to find space for the goods they now have in stock when no material change can be made in the building. Our storeroom is located on the corner, running 165 feet, and a machinery wareroom 60 x 150, and yet we are constantly economizing our space and find every nook and corner occupied. I think the only practical thing to do is for every Hardware merchant to begin and reform in the matter of order and cleanliness and arrange his goods so as to conform to the size of his room. I have been in nearly every State, and am sorry to say that when I have stumbled across a lot of old "traps and calamities" on the sidewalk, such as Churns, Threshing Machines, Stoves, Wringers, Fence Wire, &c., that look as if they were an installment from Noah's ark, I usually find a Hardware store in the vicinity. This is the case usually in the smaller towns and even in large cities It is neither artistic, æsthetic nor profitable. My experience teaches me that the best way to advertise goods is with printers' ink and with the best possible display on the inside, where the goods cannot be injured.

The following communication, containing some suggestions on this subject and also presenting some points of inquiry for the consideration of our readers, will be of interest:

There are so many things to say about the arrangement of Hardware stores, and so many ideas in use and out of use, one hardly knows where to begin, as all departments are important. What I have to say will be relating to a retail store where Tinware and Stoves as well as Hardware form part of the stock.

Very few stores have Tinware sampled. It was my good fortune to see an arrangement of Tinware that pleased me very much, and the proprietor said it was a success and paid for the room used. The Tinware, one piece of each size in stock, was fastened against the sample board on the side of the store occupied by Stoves, the sample board being about 20 feet long and extending from a 3-foot ledge to the ceiling. The larger articles are placed on this ledge. People coming in to buy one thing see others represented by sample that they want. The stock is kept on shelves in another part of the store, wrapped in the original paper, and the goods come out bright and new when sold.

My present arrangement for Carriage Bolts is the best I have used—wooden boxes, green fronts, 6 inches high, 5½ wide and 12 long, in regular shelving, with each size of Bolt marked plainly on the front of the box In these I keep Bolts up to ½ inch 10. For larger sizes up to ½ inch 16 I have open bins underneath this shelving. This keeps them from being mixed, and, being arranged in regular sizes, you know just where you can put your hand on the size wanted. I have also seen a case made 4 inches wide at the top, 20 inches wide at the bottom, with a back, and boxes about 6 x 6 from top to bottom. This will accommodate all size of Bolts, beginning with the smaller ones at the top and the longer ones at the bottom. The back is perpendicular, the slant being in front. Tin sheets large enough to extend half-way over the partition of each box are fastened by a wire running across the entire length of the case, so they can be raised separately, the wire being fastened at the end and between each lid by a blind staple. The sizes of Bolts are painted on the lids. This plan keeps the Bolts from getting mixed, and also from becoming dusty.

My arrangement for Screws is to have tinned boxes 4 inches wide, 10 inches long, with a partition about half-way back, the boxes painted green in front, with the sizes marked in black, and tea-kettle knobs for pulls. These boxes are kept in the shelving near Butts and Locks. They are convenient and I am satisfied with the arrangement. The boxes are inexpensive and take up one shelf 3 feet long, having a shelf between the regular shelving.

One of your correspondents refers to his trouble in handling Steel Goods. Perhaps this suggestion will aid him as well as others: At the end of the shelving or other convenient place in store, have a place made to stand D. H. Shovels, Manure Forks, Spading Forks, D. Handles—in fact, all D. H. goods. Above that have a shelf as wide as the room taken on the floor for the D. H. goods, and put all your L. H. goods up there. There can be turned-wood pegs driven in the wall to separate different kinds of Forks, Handles, &c. The L. H. goods can be reached from the floor and your stock kept there the year round.

I advocate wood boxes every time. As was suggested in *The Iron Age*, November 5, customers frequently do not know what they want until they see the sample article on the outside of boxes. If manufacturers would make their pasteboard boxes of uniform sizes they would look well in the shelves, and wood boxes give a finished appearance to the stock and store. When I began the Hardware business as a boy in 1869 we spent hours tying up packages of Locks, Casters, Snaps, &c., as in those days few, if any, goods were put up in boxes.

Have Osborne & Ames, the plan of whose store you published, ever used a room with the counters in the center? There is something very attractive in the idea, but before arranging a building in that way I should want to see one, and we shall be glad to have suggestions from the trade in regard to the matter. Perhaps some of them have tried it. It seems to me, however, that under this arrangement shelving would be very much contracted unless the counters and shelving ran back to the rear of the store, and then light would be poor.

I like the suggestion already made of having two-story Nail bins, and to this idea would add that a nice place to keep a small stock of Strap and T Hinges is on a shelf under counter over Nail bins. A space between counter and shelf of 6 inches will take a bundle three pair of 10-inch Half-Strap Hinges; 12 and 14 inch generally come one pair in a bundle. This saves room and is convenient. I would not have Tinware hung up in store. It does not look well, and in taking down one is apt to drop the article just as he thinks it is safe. It is better to have bins under a wide ledge for Buckets and such goods.

I know of no line of goods that does not require provision for display of samples that would not sell better if they were thus exhibited. I think that, so far as possible, stock should be kept near samples. Then it is not necessary to have all sizes of the line of goods on sample, but one size only, as that calls attention to the line. There is hardly a day that one or more customers do not come in, and, when asked what they want, reply, "Well, let me look around and see." So the more samples the better.

The diagram of Hardware store given in our last issue was in error as to the front, which was represented as having two doors and one window between them, whereas it should have shown one door with a window on each side of it. These windows, we may add, are made with a base shelf 11 inches from the floor.

One of our readers makes the following inquiries, suggestions concerning which we shall be pleased to have:

How are pint and half-pint Tin Cups best kept, also Grates and Mantels, so as not to be covered with dust and to be in a good shape to show? We should like also to know the best method of keeping and displaying Stove Boards and Oilcloth and Stove Rugs. My plan is to extend the Rugs end pattern out, tied with a string top and bottom. Is there a better way?

THE NASON MFG. CO.,

71 Beekman street, New York, issue, November 15, the following manufacturers' sheet of trade discounts:

Page.	Discount per cent.
1, Wrought Iron Pipe:	
1¼" and smaller, Butt-Welded, Plain	42½
1¼" and smaller, Butt-Welded, Galvanized	32½
1½" and larger, Lap-Welded, Plain	60
1½" and larger, Lap-Welded, Galvanized	42½
When cut to order, to cover wastage, advance 5 per cent. on discount.	
Extra Heavy Pipe:	
1¼" and smaller	40
1½" and larger	57½
When cut to order, advance 10 per cent. on discount.	
1, Lap-Welded Iron Boiler Tubes	52½
1-3, Cast Wrought and Malleable Iron Piece Fittings	70
3, Malleable Iron (Pound) Fittings	25
In quantities less than 10 pounds	13 cents, net
3, Iron Cocks—Heavy Pattern	65
3, Iron Valves, &c—Heavy Pattern	65
4, Iron Valves, &c.—No. 2 Pattern	70&10
4, Brass Valves, Cocks, &c.—Heavy Pattern	65
Quick Opening Elevator Valves	50
4, Oil Cups, Lubricators and Steam Whistles	60
5, Radiator Valves	62½
5, Brass Valves—No. 2 Pattern	70&10
5, Brass Fittings	60
5, Steam and Water Bibbs, Stops, &c	65
6, Gas Fixture Fittings	60
6, Patent Valves:	
Ludlow's	35
Peet's	45
Chapman's	25
Jenkins'	55
Kennedy's	55
6-7, Steam and Gas Fitters' Tools:	
Stocks and Dies	50
Solid Dies	50
Tongs	50
Taps	60
Vises, Nason's	30
Vises, Combination	25
Vises, Malleable Iron	25
Vises, Revolving or Angle	25
Patent Tongs and Wrenches:	
Brown's	50
Robbins'	30
Jarecki's	30
Stillson's	30
Pipe Cutters, Stanwood	25
Pipe Cutters, Saunders	30
1-3, Nason's Free End Tube Steam Boilers	35
4, Nason's Draft Regulator—Low Pressure	10
5-7, Nason's New Pattern Steam Radiators	15
8-9, Nason's Standard Steam Radiators	15
10, Nason's Duplex Steam Radiators, 34 cts. per tube, net.	
11-12, Nason's Indirect Steam Radiators	20
13, Nason's Centrifugal Fans	25
14-15, Nason's Steam Traps	30
16, Nason's Glue Heaters	30
17-19, Nason's Combination of Boiler, Pump and Base	30
21-22, Worthington Steam Pumps. Special rates.	
23, Reed's Automatic Pressure Regulators	25
24, Nason's Foot Valve and Strainer	50
25, Worthington Water Meter	25
26, Nason's Boiler Feed Pumps	50
27, Nason's Feed-Water Heater	45
28, Nason's Automatic Water Feeder	30
29, Regulating-Valve for House Tank Service. Special rates.	
30, Nason's Improved Water Column, very neat design	10
31-32, Nason's Quick-Opening Elevator Valve	50
33, Nason's Patent Foot-Rail Brackets, very handsome	30
33, Nason's Corner and End Pieces for Foot Rails	30
34, Pipe Cutting and Threading Machines	25
35, Patent I X L Cutting and Threading Machines	5
36, Nason's Pipe Vise, Open Jaw, will take Pipe at any point	20
37, Patent Chime Whistles	40
38-40, Nason's Valves, Gauges and Fittings for Anhydrous and Aqua Ammonia	45

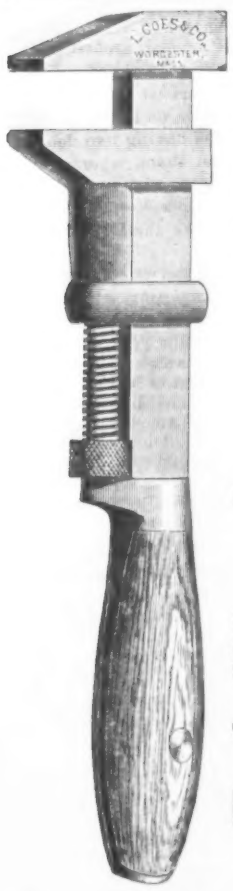
Old Metals, Rags, &c.

The purchasing prices offered by dealers are as follows:

Heavy Copper	₩ lb.	$0.08	@	$0.08¼
Light "	"	.06	@	.07
Copper Bottoms	"	.06	@	....
Brass, Heavy	"	.06	@	.06¼
" Light	"	.05	@	.05½
Composition, Heavy	"	.08	@	....
Lead, Heavy	"	.03¾	@	....
Tea Lead	"	.03¼	@	....
Zinc	"	.03	@	.03¼
Pewter, No. 1		13	@	14
Wrought Iron	₩ ton,	15.00	@	16.00
Light "	"	8.00	@	9.00
Stove Plate Iron	"	9.00	@	....
Machinery "	"	12.00	@	13.00
Grate Bars	"	5.00	@	....
Stereotype Plates	₩ lb.	.04	@	04¼
Electrotype "	"	.03¼	@	03½
Small Type	"	.05	@	05¼
Canvas, Linen	"	.03½	@	.04
" Cotton	"	.03½	@	....
" No. 2	"	.02¼	@	.02¾
White No. 1	"	.03¾	@	.04
" No. 2	"	.01¾	@	.02
Seconds	"	.00½	@	.01
Soft Woolens	"	.01¼	@	.06
Mixed Rags	"	.01½	@	.01¾
Gunny Bagging	"	.01¼	@	.01½
Jute Butts	"	.01¾	@	.01¾
Kentucky Bagging	"	.02¼	@	.02¾
Book Stock	"	.01¼	@	.01½
Newspapers	"	.00¾	@	.01
Waste Paper and Scraps	"	.00½	@	....
Kentucky Bale Rope	"	.04½	@	.04

A somewhat novel point in insurance law has just been decided in Cincinnati, where, in the case of the Tacoma Packet Co. vs. the Eureka Insurance Co., tried before Judge Sage, the jury returned a verdict for the full amount of the policy ($2500) upon which the suit was brought, with interest. The steamer W. P. Thompson was insured by the defendant company, and it was claimed by the plaintiffs that an agreement was made by telephone extending the privilege to the Mississippi River. The court held that if the defendants were in the habit of receiving insurance by telephone, a message to a clerk which the company knew had been received would bind it unless there was express dissent thereto.

The Union Springs Oil Co., Alabama; have added a barrel factory with a capacity of 60 barrels a day to their plant of oil mill, refinery, soapworks and ginnery.



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PATENT

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Sectional view illustrates our NEW KNIFE HANDLE, showing Malleable Iron Frame and Shank of Bar keyed into position.

☞ *Straight Bar, Extra LONG NUT FOR SCREW IN JAW.*

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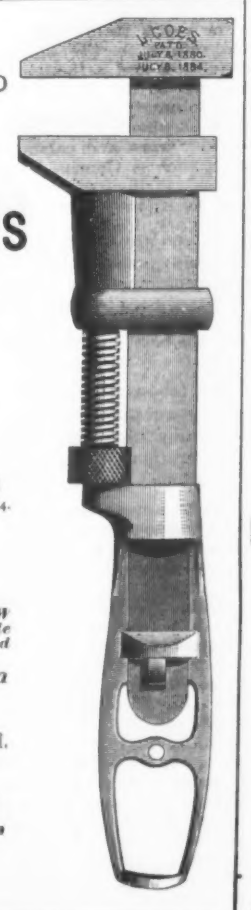

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PITTSBURGH, PA.,

BUILDERS' FINE HARDWARE,

RIM AND MORTISE DOOR LOCKS WITH

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GENUINE BRONZE AND IMITATION BRONZE KNOBS, &c., &c.

Mathes' Patent Burglar-Proof Sash Locks.

PADLOCKS.

TEA, COUNTER, UNION AND PLATFORM SCALES.

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BLACKSMITH CONES OR MANDRELS.

CAST IRON.

No. 1,	32 in.	high,	8 in.	wide at base,	weight about	56	lbs.
" 2,	48	"	12	" "	"	115	"
" 3,	52	"	14	" "	"	140	"
" 4,	54	"	15	" "	"	200	"

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Track Jacks, Carriage Makers' Vises,

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COPYING PRESSES AND STANDS, &c.

1885

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HUNTINGTON, HOPKINS & CO., San Francisco, and Sacramento, Cal.
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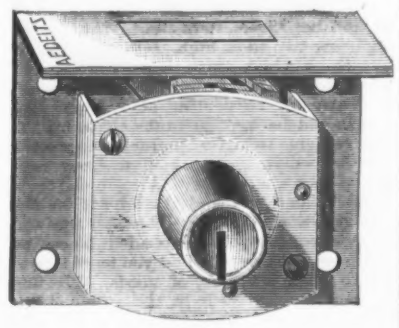

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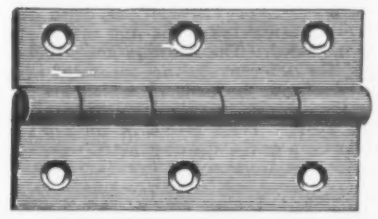

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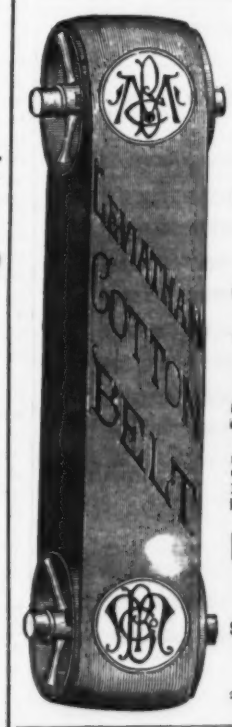

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Unsurpassed for Strength, Durability and Cheapness.

Made to any Length, Width and Strength.

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Guaranteed to Run Straight, Even Throughout.

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Retails at 20 Cents Each.

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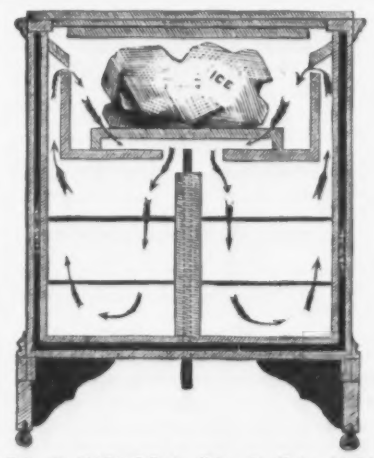

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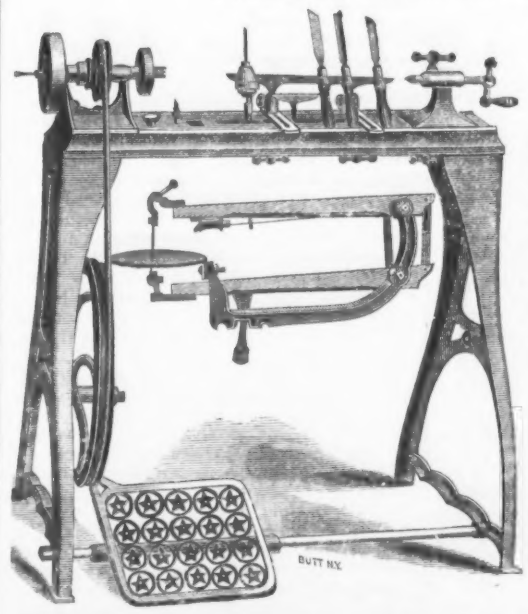
WE HAVE ADDED THE

GOODELL LATHE AND SAW,

As seen in this Cut, to our Line of SCROLL SAW SUPPLIES for the coming year.



It is by far the best Lathe in market. We have also made great improvements on the

Lester, Rogers and Cricket Saws.

Another generation of boys is coming to the front, so that the demand for these Saws is fast increasing, and seems likely to be as large as it was eight years ago. Dealers can increase their fall trade by laying in a stock.

Goodell Lathe and Tools	$10.00.
Scroll Saw Attachm't, extra	2.00.
Lester Saw and Lathe	10.00.
Rogers Saw, No. 1	3.50.
Cricket Saw, all Iron	2.50.
Bracket Sets, Nickel Plated, per doz	15 00.
Bracket Sets, Pleasure and Profit, per doz	10.00.

We are headquarters in New York for Wood, Designs and supplies of all kinds for bracket sawyers. Our Star Bracket Blades are superior to any others in use, and are in demand in many other countries.

There is a regular trade discount to all dealers.

MILLERS FALLS CO.,

74 CHAMBERS STREET, NEW YORK.

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Forged Horse Nails.

MANUFACTURED BY THE

NATIONAL HORSE NAIL CO.,

Vergennes, Vermont.

HOT FORGED AND COLD HAMMERED POINTED. MADE OF BEST NORWAY IRON AND WARRANTED.

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BEST CHARCOAL BOILER PLATES,

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ALSO BEST QUALITY HOMOGENEOUS STEEL PLATES.

We ask the special attention of the trade to our **C. H. No. 1 Boiler Plates,** which we manufacture expressly for the **Shells** of Steam Boilers and stamp **50,000 pounds T. S.** when desired. **One hundred and sixteen tests** of this iron, made during the last three years by the **U. S. Inspectors of Steam Vessels,** show an **average tensile strength** of **58,808 pounds** to the sectional square inch, and an **average reduction of area** of the fractured section of **30¼ per centum.** Our prices are as low as the production of a good article will admit of

VARIETY IRON WORKS.

ALFRED C. REX & CO.,

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PATENTED HARDWARE SPECIALTIES AND NOVELTIES.

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BRANCH OFFICES:
126 Chambers St., New York, Chas. E. Spier, Mgr. and 415 Commerce St., Phila.

New Soring Soecialties—King Egg Beaters, awarded medal at American Institute, New York; King Candle Lamp and Lantern, cheapest combination ever made.

ST. NICHOLAS SKATE.

SIMPLEST AND BEST.

We make the best Rink Skate on the market.

Send for Catalogue and Price List.

St. Nicholas Toy Co.,

784 to 794 Madison St., Chicago.

PURE TURKISH EMERY.

WALPOLE EMERY MILLS,

South Walpole, Mass.

THE WEEK.

A number of manufacturers in Pittsburh interested in what is known as the "Soho district" and vicinity contemplate building a bridge across the Monongahela, to cost $250,000.

The *Petersburger Zeitung* says it is intended to raise still higher the Russian import duties on pig iron and iron ore, because the last increase has not sufficed to exclude foreign competition.

Representative Henlay, of California, intends to renew in Congress his demand for an investigation of the manner in which the Alaska Seal Fur Co. secured the exclusive contract to catch seals in Alaska. This contract is said to be worth over $500,000 per year.

Three of the largest locomotives in the world are now being made in the City of Mexico. They have 16 drivers, will pass a curve of 20° to 25° with ease, and can carry a weight of 240,000 pounds They are intended for use on the Tehuantenpec Ship Railroad.

The Hawaiian minister at Washington proposes to obtain from the leading commercial powers a recognition of the neutrality of the islands in the Pacific Ocean, so far as existing claims of ownership permit, and that they shall be united under some form of representative government whose integrity shall be guaranteed.

The British Merchant Shipping act declares that "no ship shall be deemed to be a British ship unless she belongs wholly to natural-born British subjects." Another section denounces the penalty of forfeiture against any vessel which assumes the British national character "when owned in whole or in part by the persons not entitled by law to own British ships." Registry is forfeited if such a person becomes part owner. Despite these hindrances there is reason to believe that considerable amounts of American capital are invested in British bottoms through proxy representatives holding allegiance to the British crown.

Arrangements have been made in Pittsburgh, by Messrs. Westinghouse & Hostetter, for the immediate erection of works having a capacity of converting 1,c00,000 feet per day of natural gas into illuminating gas.

The obelisk in Central Park is now protected by an impervious coat of paraffine and is prepared to face with impunity the snows and rains of the next 25 years. So at least Mr. Caffall, the inventor of the process, says. The effect of the coating is to make the stone a shade darker.

The Dominion Government advertises for proposals for deepening the Welland Canal to a 14-foot draft, so as to admit vessels of that draft passing down the St. Lawrence without lightering. The work will cost in the neighborhood of $1,500,000. Under the pressure brought to bear by the shipping and forwarding interests of the great lakes, the Government is constrained to prosecute this measure without delay.

The coal companies doing business in Hocking Valley propose to suspend work and consult as to the feasibility of substituting machinery for manual labor, the periodical strikes having disorganized all business connected with the coal and iron interests in the valley. They will use coke in the furnaces.

The Chinese banker, Han Qua, of Canton, is said to be the wealthiest man in the world. He pays taxes upon an estate of $450,000,000, and is estimated to be worth $1,400,000,000, but this amount is thought to be greatly exaggerated.

The Sheldon Axle Co. are about completing their works on the new site at Wilkesbarre, Pa., and three railway companies, the Reading, Lehigh Valley and Delaware and Hudson are striving for precedence in building tracks across the ground.

Ex-Assemblyman Charles Cary appeared before the Sinking Fund Commissioners on behalf of the Metropolitan Water Co., who propose to supply salt water to extinguish fire, wash streets, and also to furnish the park lakes with water, by means of two reservoirs with a capacity of 12,000,000 and 5,000,000 gallons, respectively. He also offers to furnish 20,000,000 gallons daily at an annual rental of $50 for each of the 6000 hydrants to be located in that section of the city extending from Fifty-ninth street to the Battery. General Viele and President Miller, of the Board of Underwriters, thought the scheme feasible.

The Cotton Gin Manufacturers' Association of America, at their meeting in New Orleans, 12th inst., decided to abandon the ruinous credit system which has made the cotton-gin business extremely hazardous. The convention unanimously agreed to make all sales of cotton gins, feeders and condensers payable during the season in which the sales are made. The convention represented over $21,000,000 invested in the manufacture of cotton gins.

A fire which originated in the Vulcan Iron Works, Galveston, Tex., destroyed property valued at $2,000,000, comprising several of the finest residences, but the business interests of the city are not seriously affected. The insurances in New York, or through agencies located here, amount to $980,000. The only public building consumed was a frame structure, built at a cost of $20,000 The total area of the burned district is 100 acres. Forty and one-half blocks were swept clean of everything combustible. Galveston sends to New York about 30,000,000 pounds of wool annually, hides worth $3,000,000, and about 300,000 bales of cotton.

Thirteen Knights of Labor and their coadjutors at Seattle, Ore., were indicted by the Grand Jury. They are charged, under Sections 5519 and 5336 of the United States Revised Statutes, with intimidation under the Civil Rights law. The amount of bail fixed in each case by Chief Justice Green was $3000.

The project for the establishment of a line of fast ocean steamers between Fort Pond Bay, L. I., and a point on the west coast of Ireland is again revived by President Corbin and the directors of the Long Island Railroad. Plans are being prepared for a number of steamers of 7000 tons, to cost $1,500,000 each.

General Newton asserts that Flood Rock is completely destroyed, reports to the contrary notwithstanding.

Reports from the Congo River serve to confirm the belief that the project so much favored by the King of Belgium of establishing an independent State extending almost into the heart of Africa is doomed to failure. A Brussels letter says: "Taken all in all, the present state of affairs on the Congo is very discouraging. Millions of money and the life or health of hundreds of whites have been spent without showing any results. Eight years of incessant toil, of continuous battles with the climate, the savages and wild beasts, money amounting to 25,000,000 francs, conferences and endless diplomatic correspondence on one side of the ledger. And on the other? Half a dozen frame houses in a barren country, a few steamers on one of the largest rivers of the Continent, a hospital full of sick and dying, a graveyard with white victims, but no practical result whatsoever."

The Aqueduct Commissioners have received from Chief Engineer Church the following estimates: Quaker Bridge Dam, with accessories, $4.027,600; Muscoot Dam, &c., $300,000; roadways and highways, $410,500; bridges, $415,000; elevating railroad crossings, $190,000; clearing basin, $200,000—total, $5,543,100.

The International Institute for Preserving and Perfecting Anglo-Saxon Weights and Measures propose an expedition to Egypt to make investigations in the great Pyramid, and to take measurements of the units of weight and measure contained therein.

The contract for the superstructure of the Canadian Pacific Railway Co.'s bridge at Lachine has been awarded to the Dominion Bridge Co. Mr. Peterson, the engineer-in-chief of the company, estimates the cost of the work at $1,250,000, about equally divided between iron and steel work. The bridge will consist of two spans of 269 feet each, two of 408 feet each, the channel spans, and eight of 242 feet. It will be a simple iron-girded truss bridge, the track running on the top of the truss, excepting for the channel spans, where the girder rises.

The annual list of merchant vessels owned in the United States has just been completed by Captain Patton, Chief of the Navigation Division of the Treasury. It will show that the last shipping list, which gave the total number of vessels as 26,630, contained several hundred vessels which had been sold to foreign traders or put out of service before the list was compiled. The list should have shown about 24,500 vessels, and the new list will show that the total number of merchant vessels in the United States has decreased during the year by about 200, the rate of decrease being almost uniform on the Atlantic and Pacific coasts, the Lakes and the Gulf. The decrease in number is not accompanied by a proportionate decrease in tonnage. The total tonnage of the vessels constructed was 25 per cent. less than the aggregate for last year. There was a small increase in the number and tonnage of iron and steam vessels constructed, and a large decrease in the number of wooden vessels.

During the first four months of 1885 the exports of sugar from Cuba to Europe were only 62,425 tons, against 410,163 tons to the United States.

The report of the joint committee representing the Knights of Labor and business men of Galveston in the settlement of the recent strike is accepted by both sides, and no further demand will be made for the removal of the colored employees of the Mallory Steamship Co.

A serious drawback to Mexican prosperity is the difficulty of breaking up the great *haciendas*, or landed estates. Out of 10,000,000 people 50,000 own the soil, obstructing the introduction of settlers and retarding enterprise.

Since the opening of railroads in Mexico the trade in Mexican dollars is about equally divided between San Francisco and London. The exports from San Francisco are chiefly to Europe and Hong Kong in payment for goods, the balance of trade being against Mexico, and this year will amount to $10,000,000 or $11,000,000, showing a rapid increase. The 11 mints of Chihuahua, Hermosillo, Alamos, Culiacan, Durango, Zacatecas, Guadalajara, Guanajuato, Mexico, Potosi and Oajaca are leased out to private individuals. The mints thus become simply factories in which a commodity is turned out in a convenient shape for exportation, and called a "Mexican dollar."

Advices from Washington are to the effect that efforts to induce European Governments to reopen their markets to the American hog are unremitting. Assistant Secretary of State Porter says the French Government has already receded from its prohibitory decree and permitted the importation under certain restrictions, and that further negotiations are pending looking to the abrogation of the remaining restrictions. Germany, however, remains intractable.

The mint at Carson City, Nev., has been permanently closed.

A United States war ship is about to be dispatched to the Samoan or Navigators' Islands for the purpose of opening communication with that Government. The chief ports are Apia, the capital, and Pango-Pango.

A new storage reservoir is to be buit at Baldwinsville, L. I., capable of holding 150,000,000 gallons of water, and which is to cost $2,500,000.

The loss by the burning of the Southside Foundry, in Pittsburgh, is estimated at $30,000; partially insured.

The labor societies and social organizations are advocating with much earnestness the enforcement of an eight-hour law, to take effect May 1, 1886. One of the prominent leaders in his "organ" contends that "five hours of daily labor are enough to fill the land with all good things, and also give to every man a job."

The meadows between New York and Newark, N. J., comprise vast tracts of land of little value except as affording sites for factories emitting noxious fumes. The Newark Board of Trade have approved a plan for dyking and reclaiming 1000 acres at a total cost of $3194 the first year and, $1000 per annum thereafter. A steam dredge penetrates the meadows in any direction without difficulty, forming an embankment on either side.

A leading member of the Glassworkers' Association says there are as skillful workmen in this country as in any in the world, and, in reference to displacing foreign products, adds: "For years foreign manufacturers have had a monopoly of the trade in colored glass, but at last home manufacturers have awakened to the fact that they can excel all competitors in the manufacture of all colors and shades, and also the production of novelties. During the past few weeks several firms have been turning out novelties, combining two or more colors, with a success that in the production of glass making is unprecedented."

The Pacific Mills, of Lawrence, Mass., have a capital of $2,500,000; number of mills and buildings, 23, in which there are 46 steam engines of all sizes, representing 8500 horse-power; annual capacity, 100,000,000 yards, equal to two and one-quarter times the distance around the world; number of persons employed, 5500; pay-roll for the year, $1,790,000; tons of coal consumed per annum, 25,000.

In anticipation of the meeting of Congress next month our commercial bodies are bestirring themselves to secure a uniform bankrupt law. On Thursday the Bankruptcy Committee of the Chamber of Commerce passed a resolution asking President Cleveland to incorporate in his annual message a recommendation to Congress for the passage of a law which will meet all requirements of the commercial and financial interests of the country. On invitation to the Board of Trade and Transportation, representatives of the following interests met to consider what joint action could be taken with similar objects: Bar Association, Mercantile Exchange, Stationers' Board of Trade, Mechanics' and Traders' Exchange, Building Material Exchange, Clothiers' Association, Association of Jobbers and Importers of China, Glass and Earthenware. A committee of five was named to consider in detail the best method of securing introduction in Congress of the Lowell bill as it passed the Senate last year.

A new public building in New York City, which would permit the Tombs and Court of Sessions to be under one roof would save $50,000 per annum in the expense of transportation.

In answer to an invitation issued by Nathaniel McKay some 25 gentlemen met in the Fifth Avenue Hotel on Friday evening, for the purpose of listening to Baron De Lorme's report about railroad building in China. The Baron affirmed that a company formed by American capitalists would receive the countenance and support of the Emperor of China, whose agents in this country had already decided that the American railway system was the best of any in use. Since the first futile attempt at railroad building in China in 1857, the Baron claims, a great change has taken place in the feelings of the people as well as the policy of the Government, and instead of opposition investors would find ready aid and assistance in such projects. A committee consisting of W. H. Barnum, A. H. Green, A. S. Hewitt, J. T. Ripley and Russell Sage were appointed to confer with Baron De Lorme about the formation of a company to operate in railroad building in China The Chinese minister at Washington, also merchants in London, say that the Baron is without credentials; they have no knowledge of him.

A proposed fire-proof library building in St. Louis will cost $300,000.

Commodore Sicard, chief of the Bureau of Ordnance of the Navy Department, urges the purchase of a swift torpedo-boat from one of the celebrated makers abroad. "Such craft," says Commodore Sicard, "combine qualities which can only be judiciously united and skilfully and economically embodied by builders who have had large experience in this special branch of construction. There are several firms abroad that have had such experience, and a really fine boat purchased from one of them would furnish us an example of the utmost progress that has thus far been made in this difficult branch of construction, and could be examined and tested by our shipbuilders, and would doubtless be a source of great benefit to them in designing and competing for the numerous boats of this class that we require immediately. The sizes of these boats gradually increases abroad. A length of 110 feet has been thought sufficient heretofore, but now the more advanced firms are building a length of 120 and 140 feet, and more boats even 200 feet long are being projected.

Senator Leland Stanford, of California, proposes to establish a great university in that State, and has made a formal transfer of property with this object. The endowment is to be $20,000,000. Of this sum $5,000,000 will be supplied by three famous estates, upon one of which—covering 7000 acres and lying about 40 miles from San Francisco—the buildings of the university are to be erected.

In ordinary seasons the close of internal navigation would take place about the present date, as appears from the following:

	Lake opened.	Canal opened.	Canal closed.
1875	May 12	May 18	December 30
1876	May 4	May 4	December 1
1877	April 17	May 8	December 7
1878	March 16	April 15	December 7
1879	April 24	May 9	December 6
1880	March 19	April 20	November 20
1881	May 1	May 17	December 6
1882	March 26	April 11	December 7
1883	April 28	May 7	December 1
1884	April 25	May 7	December 1

Against present prospects of water competition the railroads have to offset the recent advance both in east and west bound freight rates. A restoration of rates affecting several important Southern lines also took effect at the close of the week. Thus far the domestic movement of breadstuffs has been considerably below that of the last two previous years, the receipts at the six principal Lake ports comparing as follows: 1885, 161,429,357 bushels; 1884, 175,192,740 bushels; 1883, 178,314,169 bushels. Shipments: 1885, 137,837,899 bushels; 1884, 151,982,670 bushels; 1883, 150,269,181 bushels.

The report of Engineer Menocal, U. S. N., upon the Nicaraguan Canal route recently surveyed by a party of which he was at the head, has been made public. The expedition sailed from New York December 20, 1884, and arrived at the confluence of the Rio San Juan with the River Sarapiqui, the point of preliminary operations, on the 22d of January. The proposed route extends from the harbor of Greytown, on the Caribbean Sea, to Brighton, on the Pacific. Its total length is 169.8 miles, of which 38.98 miles will be excavated canal and 130.82 miles navigation by Lake Nicaragua, the River San Juan, the basin of the River San Francisco and seven locks. The Lake (or inland sea) of Nicaragua is about 90 miles long and 40 wide, and will be connected with the Pacific by a canal and with the Atlantic by slack-water navigation in the River San Juan, by a short section of canal from the River San Juan to the basin of the River San Francisco, by navigation through this basin and by a canal thence to the Caribbean Sea. It is estimated that the canal can be completed in six years and will cost, including a contingent of 25 per cent. added, $64,043,697.

The three shot manufacturers of St. Louis have by agreement fixed the price of shot in that city at about $1.18 per bag, which is a drop of 23½ cents since the National Association met there a couple of weeks ago and attempted to restore the combination price.

The scheme for diverting the grain export trade from New York to New Orleans by way of the Mississippi River has had no appreciable effect thus far. Its inefficiency is demonstrated by the fact that the volume of the New Orleans grain exports declined from 12,171,824 bushels in the calendar year 1883 to 5,921,210 bushels in 1884. During the same constrasted periods the grain exports from this city fell from 73,065,928 bushels to 67,940,496—an insignificant ratio of decline compared to that shown at New Orleans.

The plans for draining the valley of Mexico involve the construction of a canal from Lake Tezcoco to Lake Zumfrango. Thence the water is to pass through a tunnel 5½ miles long. The estimated expense of the work is $4,000,000.

The centennial banquet of the Society of Mechanics and Tradesmen, at Delmonico's, on Monday evening, was attended by more than 200 guests. Judge Daly, Senator Hawley, ex-Governor Hoffman, Mr. Depew, Rev. Robert Collyer, General Porter, Whitelaw Reid and Abram S. Hewitt were among those who responded to the various toasts. Judge Daly said that the society now own the property at the northwest corner of Broadway and Park place; that its revenue is about $40,000 a year; that it owns the library and buildings in Sixteenth street; that there were about 8000 persons supplied with books by the Apprentices' Library last year. To the opportunities for self-improvement which he received from his access to the Apprentices' Society Justice Daly attributed his advancement in life.

A somewhat significant statement has been made by the Delaware and Hudson Canal Co. in a protest against a tax assessment. It is that if a railroad were built the anthracite coal could be transported to tidewater for 54 cents. The question arises, Why does coal cost so much at tidewater as it does?

H. B. Claflin, the eminent dry-goods merchant, died suddenly in Fordham November 14, of apoplexy, in the 74th year of his age. From a comparatively small beginning, when the firm was located in the basement of Trinity Building, his business rapidly grew until it amounted to many millions of dollars per annum. His house was for many years the consignee for nearly all the great mills in the East.

The Cunarder Etruria arrived at this port Sunday afternoon 10 hours ahead of the Guion Line steamer Alaska. Both ships left Liverpool on November 7. The Alaska's time from Queenstown was 7 days, 4 hours 33 minutes.

Frederick Schuchardt, best known some years ago as head of the firm of Schuchardt & Gebhard, shipping merchants and bankers, died in this city, 13th inst., aged 80 years.

A cargo steamer, built to run cheaply at low speed, recently left England for China with a cargo weighing 5,600,000 pounds. During the first part of her voyage, from Plymouth to Alexandria, the consumption of coal was 282,240 pounds, the distance being 3380 miles; the consumption per mile was, therefore, only 83.5 pounds, and the consumption per ton of cargo per mile, 0.028 pound; in other words, ½ ounce of coal propelled 1 ton of cargo a mile.

Edward E. O'Brien, of Thomaston, Me., owns 10 ships, aggregating 20,000 tons, engaged in the California and Callao trade. He inherited his fleet from his father, Edward O'Brien, of Thomaston, who died in 1882. The latter began life as a poor ship carpenter in the town of Warren. He built a schooner and took a share, and in this way laid the foundation for his fortune. He built before he died 100 vessels, and kept an open account with Baring Brothers, of London, for 58 years.

The navy-yards of the United States are in such a state of decay that Commodore Harmony, the chief in charge, estimates the amount required for repairs and maintenance at near $10,000,000.

Twenty-nine lives have been lost by casualties during the six months that the new Croton Aqueduct has been in course of construction.

The power hammers made in the United States enjoy a high reputation abroad, if we may judge from the frequent orders received for them by the manufacturers. We see it stated that Sweden has been ordering Vulcan power hammers from the firm of Duncan & Co., of Bellefonte, Pa., and that orders for them are being constantly received from other foreign countries.

It is reported that DePaw's American Plate Glass Works will at an early day begin boring a well in search of gas to be used for fuel. Within 35 miles of New Albany there is a plentiful supply of the gas, and, with every reason to believe that a vein will be tapped, these enterprising gentlemen will sink an auger until they ascertain whether there is truth at the bottom of a well or not. The result will be a few thousand dollars lost or a great many thousand gained.

The three furnaces in the Hocking Valley which were banked on account of the strike, it is expected now, will be opened within the next few days, and coke will be used in their operation instead of coal. This will be brought from Connellsville, Pa., and West Virginia, and will be shipped directly to the furnaces. The furnacemen claim they cannot pay more than 40 cents for mining coal with which to operate the furnaces and at the same time compete with the Southern Iron trade. In addition to the movement to use coke, extensive preparations are being made to put in mining machinery in the majority of the mines.

Chief Naval Constructor Wilson, in submitting his estimates for the coming year, asks that nearly $3,000,000 shall be spent in completing the double-turreted monitors, and that $5,000,000 shall be appropriated for building the hulls of new steel vessels—one of 7500 tons, one of 5000, one of 3000, one of 2400, one of 2000 and two of 800. The proposed armored vessel of 7500 tons would have a mean draft of 24 feet. Constructor Wilson expresses the opinion that it should be the policy of the Government to maintain one large navy-yard, combining in itself the advantages and facilities of all the others. He earnestly advocates the thorough scientific and technical education of assistant naval constructors, both in naval architecture and in the management of shipyards. The matter, he says, is better understood and managed abroad.

Current Hardware Prices, November 18, 1885.

HARDWARE.

Ammunition.
Caps, Percussion, ℔ 1000—
Hicks & Goldmark's
F. L. Waterproof, 1-10's...50¢ / E. B. Trimmed Edge, 1-10's...65¢ / E. B. Ground Edge, Central Fire, 1-10's.70¢ / Double Waterproof, 1-10's...$1.40 } dis 25@25&5 %
Musket Waterproof, 1-10's...50¢
G. D...28¢
S. B...30¢
Union Metallic Cartridge Co.
F. C. Trimmed...50¢ / F. L. Ground...65¢ / Cen. Fire Ground...70¢ / Double Waterproof...$1.40 / Double Waterproof, in 1-10's...$1.40 } dis 25@25&5 %
S. B. Genuine Imported...45¢
Eley's E. B...50¢
Eley's D Waterproof, Central Fire...$1.60
Cartridges—
Rim Fire Cartridges...dis 60&2 %
Rim Fire Military Cartridges...dis 15&2 %
Cen. Fire Cartridges, Pistol and Rifle...dis 40&2 %
Cen. Fire Cartridges, Military & Sporting..dis 30&2 %
Blank Cartridges, except 22 and 32 cal., an additional 10 % over above discounts.
Blank Cartridges, 22 cal...$1.50
Blank Cartridges, 32 cal...$3
Primed Shells and Bullets...dis 25&2 %
B. B. Caps, Round Ball...$1.60
B. B. Caps, Conical Ball, Swaged...$1.75
Primers—
Berdan Primers, all sizes, and B. L. Caps (for Sturtevant Shells)...90¢
All other Primers, all sizes...$1.10
Shells—
Paper Shot Shells, 1st & 2d or S. G. qual.dis 25&5&2 %
Seibold's Combination Shot Shells...dis 25&10&2 %
Paper Shot Shells, Club, Rival, Climax.dis 40&5&2 %
Paper Shot Shells, Star Brand...dis 50&5&2 %
Brass Shot Shells, 1st quality...dis 60&2 %
Brass Shot Shells, Club, Rival & Climax...dis 65&2 %
Wads—
U. M. C. & W. R. A.—B. E., 11 up...$2.00 / U. M. C. & W. R. A.—B. E., 9&10...2.30 / U. M. C. & W. R. A.—B. E., 7&8...2.60 / U. M. C. & W. R. A.—P. E., 11 up...3.10 / U. M. C. & W. R. A.—P. E., 9&10...4.00 / U. M. C. & W. R. A.—P. E., 7&8...4.90 } ..dis 20 &2 %
Eley's B. E., 11 up...$1.75
Eley's P. E., 11 @ 20...$2.80

Anvils.
Eagle Anvils...℔ lb 10¢—dis 20 %
Wright's...9¾ @ 10¢
Armitage's Mouse Hole...9¢
Armitage Mouse Hole, Extra...11½¢
Trenton...9½¢
Wilkinson's...9½¢@10¢
J. & Riley Carr, Patent Solid...11@11½¢
Anvil Vise and Drill—
Millers Falls Co., $18.00...dis 20 %
Cheney Anvil and Vise...dis 25 %
Allen Combined Anvil and Vise, $2.50...dis 40 %
Richardson's Vise and Anvil...dis 25 %

Apple Parers.
Advance...℔ doz $4.50
Champion...℔ doz $7.50
Empire State...each $9.00
Eureka...each $12.00
Family Bay State...℔ doz $12.00
Gem...℔ doz $5.00
Improved Bay State...℔ doz $28.00
Improved Penn, 1884...℔ doz $5.50
Jersey...℔ doz $5.00
Little Star...℔ doz $5.00
Model...℔ doz $4.25
New Lightning...℔ doz $6.50
Rocking Table...℔ doz $6.50
Triumph, 1883...℔ doz $6.00
Turntable...℔ doz $5.00
Two-Knife...℔ doz $6.50
Waverly...℔ doz $4.50
White Mountain...℔ doz $4.75
Whittemore's Perfection...℔ doz $6.00
Whittemore's Simplicity...℔ doz $6.00
"72"...℔ doz $4.25
"76"...℔ doz $5.50
"78"...℔ doz $6.50

Augers and Bits.
Douglass Mfg. Co...dis 70 %
Other First Quality...dis 60&10&5 @ 70 %
Snell's...dis 60@60&7½ %
Cook's, Douglass Mfg. Co...dis 55 %
Cook's, New Haven Copper Co...dis 50&10@50&10&5 %
Ives' Circular Lip...dis 60 %
Patent Solid Head...dis 30 %
C. E. Jennings & Co., No. 5...dis 40&10 %
C. E. Jennings & Co., No. 30...dis 60&10 %
C. E. Jennings & Co., Auger Bits, in fancy boxes. ℔ set, 32½ quarters, No. 5, $5; No. 30, $5...dis 20 %
Lewis' Patent Single Twist...dis 45 %
Russell Jennings' Augers and Bits...dis 25 %
Imitation Jennings Bits (new list).dis 50&10@50&10&5 %
Car Bits, Snell Mfg. Co...dis 40&10&10 %
Car Bits, New Haven Copper Co...dis 50&10 %
L'Hommedieu Car Bits...dis 15 %
Snell Mfg. Co.'s Jennings' Bits (new list)...dis 50&5 %
Expansive Bits—
Clark's small, $18; large, $26...dis 35@35&5 %
Ives' No. 4, per doz., $60...dis 35@35&5 %
Swan's...dis 40 %
Ansonia...dis 25 %
Steer's, No. 1, $26; No. 2, $22...dis 35 %
Hollow Augers—
Ives' / French, Swift & Co. / Douglass' } dis 25&10 %
Bonney's Adjustable ℔ doz. $48...dis 40&10 %
Stearns' Adjustable ℔ doz. $48...dis 20&10 %
Ives' Expansive, each $4.50...dis 45 @ 50 %
Universal Expansive, each $4.50...dis 20 %
Wood's...dis 25 %
Gimlet Bits—
Common...℔ gross $3.00 @ $3.25
Diamond...℔ doz. $1.10, dis 25&10 %
"Bee"...dis 25 %
Double Cut, Shepardson's...dis 45 %
Double Cut, Ct. Valley Mfg. Co...dis 30&10 %
Double Cut, Hartwell's, ℔ gro, $6.50...dis 10 %
Double Cut, Douglass'...dis 40 %
Double Cut, Ives'...dis 50&10 %
Drill Bits—
Syracuse Twist...dis 30 @ 30&5 %
Holt's Bit Stock Drills...dis 25&10 %
Ship Augers and Bits—
L'Hommedieu's...dis 15 @ 20 %
Watrous's...dis 15 @ 20 %
Snell's...dis 15 @ 20 %
Snell's Ship Auger Pattern Car Bits...dis 15 @ 20 %

Awl Hafts.
Sewing, Brass Ferrule...$3.50 ℔ gross—dis 40&10 %
Patent Sewing, Short...$1.00 ℔ doz—dis 40&10 %
Patent Sewing, Long...$1.20 ℔ doz.—net
Patent Peg, Plain Top...$10.00 ℔ gross—dis 40&10&5 %
Patent Peg, Leather Top.$12.00 ℔ gross—dis 40&10&5 %

Awls, Brad Sets, &c.
Awls, Sewing, Common...℔ gross $1.70—dis 35 %
Awls, Shouldered Peg...℔ gross $2.45—dis 40 %
Awls, Patent Peg...℔ gross 63¢—dis 40 %
Awls, Shouldered Brad...$2.70 ℔ gross—dis 35 %
Awls, Handled Brad...$7.50 ℔ gross—dis 45 %
Awls, Handled Scratch...$7.50 ℔ gross—dis 35&10 %
Awls, Socket Scratch...$1.50 ℔ doz—dis 25 @ 30 %

Awls and Tools.
Aiken's Sets, Awls & Tools...℔ doz. $10.00—dis 50&10 %
Adj. Tool Handles, No. 1...℔ doz $12—dis 25 @ 25&10 %
Adj. Tool Handles, No. 2...℔ doz $18—dis 25 @ 25&10 %
Brad Sets, No. 42, $10.50; No. 43, $12.50...dis 70&10&5 %
Brad Sets, Stanley's Excelsior, No. 1, $7.50. / Brad Sets, Stanley's Excelsior, No. 2, $4.00. / Brad Sets, Stanley's Excelsior, No. 3, $5.50. } dis 25&10 %

Axes.
Best according to brand...℔ doz $6.25 @ $7
Good Seconds...$5.50 @ $6

Axle Grease.
Frazer's, in bulk...Keg ℔ lb, 5¢; Pail, ℔ lb, 6¢ net
Frazer's in boxes...℔ gross $10.00 net

Axles.
Nos. 1 to 6...dis 60 %
Nos. 7 to 18...dis 60&10 %
Nos. 19 to 22...dis 70&10 %
Nos. 23 to 26...dis 60&10 %
Tubular Wrought Steel (National Self-Oiling):
Less than 10 sets...dis 33⅓ %
Over 10 sets...dis 33⅓&5 %

Bag Holders.
Sprengle's Pat., ℔ doz $18...dis 60 %

Balances.
Spring Balances...dis 40&10 @ 40&10&5 %
Common 24 lb...℔ doz., $1.50—dis 40&10 @ 50 %

Bells.
Hand—
Light Brass...dis 75&10 @ 80&5 %
Extra Heavy...dis 65&10 @ 70 %
White Metal...dis 70 @ 70&5 %
Silver Chime...dis 25&10&5 %
Globe (Cone's Patent)...dis 25&10 %
Door—
Gong, Abbe's...dis 25&10 %
Gong, Yankee...dis 40&10 %
Gong, Barton's...dis 40&10 %
Crank, Taylor's...dis 25&10 %
Crank, Brooks'...dis 50&10&2 %
Crank, Cone's...dis 10 %
Crank Connel's...dis 20&10 %
Lever, Sargent's...dis 60&10&10 %
Lever, Taylor's Bronzed or Plated...net
Lever, Taylor's Japanned...dis 25&10 %
Lever, R. E. M. Co.'s...dis 50&10&2 %
Pull, Brook's...dis 50&10&2 %
Pull, Western...dis 25&10 %
Cow—
Common Wrought...dis 60&10 @ 60&10&5 %
Western...dis 20&10 %
Western, Sargent's list...dis 70&10 %
Kentucky "Star"...dis 20&10 %
Kentucky, Sargent's list...dis 70&10 %
Dodge, Genuine Kentucky, new list...dis 70 %
Nos. 0 1 1½ 2 3 4 5 6 7 Hog
$12.00 10.00 9.00 8.00 6.00 5.00 4.00 3.00 2.50 5.00
Texas Star...dis 50&10 @ 50&10&5 %
Call...dis 40@40&5 %
Farm Bells...℔ lb, 3 @ 3¼¢
Steel Alloy Church and School Bells...dis 40 %

Bellows.
Blacksmiths'...dis 50&10@50&10&5 %
Molders'...dis 50@50&5 %
Hand Bellows...dis 50@50&5 %

Belting, Rubber.
Standard...dis 70&5 % / Extra...dis 60@60&10 % / N. Y. B.& P. Co., Standard...dis 60 % / N.Y.B.&P.Co., Ex. Standard..dis 50&10 % / Cleveland Rubber Co., Extra Standard...dis 60&10 % } dis 5 % cash.

Bench Stops.
Hotchkiss's...℔ doz $5.00—dis 10 %
Weston's, per doz No. 1, $10; No. 2, $9...dis 25&10&5 %
McGill's...℔ doz $3—dis 10 %
Morrill's...℔ doz $7.50—dis 40&5@50 %

Bit Holders.
Extension, Barber's...℔ doz $15.00—dis 40&5 %
Extension, Ives'..℔ doz $20.00—dis 40&10 @ 40&10&5 %
Diagonal...℔ doz $24.00—dis 40 %
Angular...℔ doz $24.00—dis 40&5 %

Blind Adjusters.
Domestic...℔ per doz $3.00—dis 30 %
Excelsior...℔ doz $10.00—dis 50&10&2 %

Blind Fasteners.
Mackrell's...℔ doz pairs, $1.00—dis 20&10 %
Van Sand's Screw Pattern...$15 ℔ gro.—dis 50&10 %
Van Sand's Old Pattern...$15 ℔ gro.—dis 50&10 %
Washburn's Old Pattern...$9 ℔ gro. net
Merriman's...new list, net
Salisbury & Austin No. 2008...$9 ℔ gro. net
Security Gravity...$9 ℔ gro. net

Blind Staples.
Barbed, ½ in. and larger...℔ lb 8 @ 8½¢ net
Barbed, ⅜ in...℔ lb 9 @ 9½¢ net

Blocks.
Tackle Blocks, &c, list April 17, 1885...dis 20 %
Reed Mfg. Co. Self-Lubricating...dis 50 %

Bolts.
Door and Shutter—
Cast Iron Barrel, Square, &c...dis 70 @ 70&5 %
Cast Iron Shutter Bolts...dis 70 @ 70&5 %
Cast Iron Chain (Sargent's list)...dis 70 @ 70&5 %
Ives' Patent Door Bolts...dis 55&10 %
Wrought Barrel...dis 70 @ 70&5 %
Wrought Square...dis 70 @ 70&5 %
Wr't Shutter, all Iron, Stanley's list...dis 60&10 %
Wr't Shutter, Brass Knob, Stanley's...dis 40&10 %
Wrought Shutter, Sargent's list...dis 60&10&5 %
Wrought Sunk Flush, Sargent's list...dis 60&10&5 %
Wrought Sunk Flush, Stanley's list...dis 40&10&5 %
Wrought B K.Flush, Com'n Stanley's list.dis 55&10 %
Carriage—
Com. list June 10, '84...dis 80 @ 80&5 %
Genuine Eagle, list Oct., '84...dis 75&5@75&10 %
Phila. pattern, list Oct. 7, '84...dis 75&10@80 %
R. B. & W., old list...dis 70&5 %
Tire—
Common, list Feb. 28, 1883...dis 70 @ 70&5 %
Am. S. Co., Norway, Ph'l., list Oct. 16, '84...dis 82½ %
Am. S. Co., Eagle, Phil., list Oct. 16, '84...dis 82½&5 %
Am. S. Co., Bay State, list Feb. 28, '83...dis 70 %
R. B. & W., Philadel. list Oct. 16, 1884...dis 80&5 %
Stove and Plow—
Stove...dis 70 @ 70&5 %
Plow...dis 65 %
R. B. & W., Plow...dis 50&5 %
R. B. & W., Stove...dis 70&5 %
Machine...dis 80 %
Bolt Ends...dis 80 %

Borax...℔ lb 8½¢ @ 9¢

Boring Machines.

Without Augers.	Upright.	Angular.
Douglas	$5.50	$6.75...dis %
Snell's, Rice's Patent	5.50	6.75.dis 40&10&10 %
Jennings	5.50	6.75.dis 45@45&10 %
Other Machines	2.50	3.00...net
Phillips' Pat., with Augers	7.00	7.50...net

Bow Pins
Humason, Beckley & Co.'s, Nos 1 and 2—dis 60&10 @ 60&10&5 %
Humason, Beckley & Co.'s other Nos..dis 70 @ 70&10 %
Sargent & Co.'s...$17 and $18, dis 60&10 %
Peck, Stow & W. Co...dis 50&10 @ 50&10&5 %

Braces.
Q. S. Backus...dis 50&10 @ 50&10&10 %
Barber's, Nos. 10 to 16...dis 50 %
Barber's, Nos. 30 to 33...dis 50 %
Barber's, Nos. 40 to 63...dis 50&10 %
Spofford's...dis 50&10 @ 50&10&10 %
Ives' Patent Braces...dis 60@60&5 %
Common Ball, American...dis 55&10 %
Bartholomew's, Nos. 25, 27, 30...dis 50&5 @ 50&10&5 %
Bartholomew's, Nos. 117, 118, 119...dis 65 %
Amidon's Barker's Imp'd...dis 60@60&10&5 %
Amidon's Corner Brace...dis 40 @ 40&5 %
Universal...8 in., $1.90; 10 in., $2.10
Buffalo Ball...8 in., $1.50 @ $1.55

Brackets.
Shelf, plain, Sargent's list...dis 60&10 %
Shelf, fancy, Sargent's list...dis 60&10&10 %
Reading, plain...dis 60&10&5 %
Reading, Rosette...dis 66⅔&10 %

Bright Wire Goods.
Regular list...dis 70&10&5 @ 70&10&10&5 %

Broilers.

Henis' Self-Basting	Inch	9	10	9 x 11
	Per doz	$4.50	5.50	6.50

Buckets.—See Well Buckets and Pails.

Bull Rings.
Union Nut Co...dis 55 %
Sargent's...dis 66⅔&10 %
Hotchkiss' low list...dis 30 %
Humason, Beckley & Co.'s...dis 70&10 %
Peck, Stow & W. Co.'s...dis 50&10 %
Ellrich Hdw. Co., White Metal, low list...dis 50 %

Butts.
Brass—
Wrought Brass...Association price, dis 70 %
Cast Brass, Tiebout's...dis 40 %
Cast Brass, Corbin's F. Joint...dis 33⅓&10@33⅓&10&10 %
Cast Brass, Loose Joint...dis 33⅓&10@33⅓&10&10 %
Cast Iron—
Fast Joint, Narrow...dis 60&10@60&10&5 %
Fast Joint, Broad...dis 60&10@60&10&5 %
Loose Joint / Loose Joint, Japanned / Loose Joint, Jap. with Acorns / Parliament Butts / Mayer's Hinges / Loose Pin, Acorns / Loose Pin, Acorns, Japanned / Loose Pin, Acorns, Jap, Pltd.Tips } dis 70&10&5 @ 70&10&10&5 %
Wrought Iron—
Fast Joint Narrow...dis 60&10&10 %
Fast Joint, Lt. Narrow...dis 60&10&10 %
Fast Joint, Broad...dis 60&10&10 %
Loose Joint, Broad...dis 60&10&10&5 %
Table Butts, Back Flaps, &c...dis 60&10&10 %
Inside Blind, Regular...dis 60&10&10 %
Inside Blind, Light...dis 60&10&10 %
Loose Pin, Wrt...dis 60&10&10&5 %
Loose Pin, Light...dis 60&10&10 %
Bronzed Wrought Butts...dis 45&5@45&10 %
Blind Butts—
Parker...dis 75&2 %
Palmer...dis 50&5&10 %
Seymour...dis 70&2 %
Lull & Porter...dis 80&10 %
Nicholson...dis 45&10 %
Huffer...dis 50
Clark's, Nos. 1, 3, 5...dis 80 %
Manhattan Hardware Co...dis
Sargent's, Nos. 1, 3...dis 75&10 %
Sargent's, No. 12...dis 75&10&5 %
Reading's Gravity...dis 75&10 %
Shepard's "Noiseless," Nos. 50, 60, 65, 45 and 55...dis 75&10&5 @ 80 %
Shepard's Champion Gravity, No. 75...dis 80&10 %
Shepard's "Gravity," Nos. 1, 3 and 5..dis 80 @ 80&5 %
North's Automatic Blind Fixtures, No. 2, for Wood, $9; No. 3, for Brick, $10.50.
Shepard's "O. S." and "Acme" Lull & Porter...dis 75&10&5 %
Shepard's "Queen City" Reversible...dis 75&10&5 %
Clark's Improved Shutter Hinge, Nos. 0, 1, 1½, 2, 2½, 3...dis 70 %

Butcher's Cleavers.
Humason & Beckley Mfg. Co...dis 30&5 @ 30&10 %
Bradley's...dis 25 @ 30 %
Beatty's...dis 33⅓&5 %
1 2 3 4 5 6 7 8
$16.50 19.00 21.50 24.00 27.00 30.00 33.50 36.50
New Haven Edge Tool Co.'s...dis 40 %
Albertson Mfg. Co...dis 33⅓ @ 33⅓&5 %

Calipers.—See Compasses

Can Openers.
Messenger's Comet...℔ doz $3.00, dis 25 %
American...℔ gross $3.00
Duplex...℔ doz 25¢, dis 15 @ 20 %
Lyman's...℔ doz $3.75, dis 20 %
No. 4, French...℔ doz $2.25, dis 55 @ 60 %
No. 5, Iron handle...℔ gross $6.00, dis 45 @ 50 %
Eureka...℔ doz $2.50, dis 10 %
Sardine Scissors...℔ doz $7.00, dis 55 %
Star...℔ doz $5.00, dis 25&5 %
Sprague, No. 1, $2; No. 2, $2.25; No. 3, $2.50...dis 50&10&10 %
World's Best, ℔ gross, No. 1, $12.00; No. 2, $24.00; No. 3, $36.00...dis 50&10 %
Universal...℔ doz $3.00, dis 35&5 %
Domestic...℔ doz $2.50, dis 45 %
Champion...℔ doz $2.00, dis 50 %

Cards.
Horse and Curry...dis 10 %
Cotton...New list, Aug., 1883, dis 10 %
Wool..." " " dis 10 %

Carpet Stretchers.
Cast Steel, Polished...℔ doz $3.25
Cast Iron, Steel Points...℔ doz 80¢
Socket...℔ doz $1.75
Bullard's...dis 25 %

Carpet Sweepers.
Bissell No. 5...℔ doz $17.00
Bissell No. 7 New Drop Pan...℔ doz $19.00
Bissell No. 12 Hall Sweeper...℔ doz $42.00
Mystic...℔ doz $17.00
Cottage...℔ doz $15.00
Garland...℔ doz $19.00
Queen...℔ doz $16.00
Queen, with band...℔ doz $18.00
King...℔ doz $30.00

Cartridges.—See Ammunition

Casters.
Bed / Plate / Shallow Socket } dis 60&5@60&10 %
Deep Socket...dis 45 @ 50 %
Yale Casters, reduced list May, 1884...dis 25@25&10 %
Martin's Patent (Phoenix)...dis 45&10 @ 50 %
Payson's Anti friction...dis 60 %
"Giant" Truck Casters...dis 10 @ 10&5 %
Stationary Truck Casters...dis 45&10

Cattle Leaders.
Humason, Beckley & Co.'s...dis 75 %
Sargent's...dis 66⅔&10 %
Hotchkiss...dis 30 %
Peck, Stow & W. Co...dis 50&10 %

Chain.
Trace, 6½-10-2 Exact...℔ pair 79¢ / Trace, 6½-10-3 Exact...℔ pair 70¢ / Trace, 7-10-2 Exact...℔ pair 86¢ } dis 50&10 @ 60 %
Log, Fifth, Stretcher, and other fancy Chains, list Nov. 1, 1884...dis 50&10 @ 60 %

American Coil	3-16	¼	5-16	⅜	7-16	½
	$0.8	.06	.05¼	.04¾	.04½	.04¼

German Coil, list of June, 1881...dis 55&5 %
German Halter Chain, list of June, 1884...dis 55&5 %
Covert Halter, Hitching and Breast...dis 50&2 %
Covert Traces...dis 35&2 %
Meneely's Breast, Halter and Hitching...dis 50&10 %
Meneely's Pat. Sleeve-Snap Breast...dis 50&10
Oneida Halter Chain (old list)...dis 45 %
Galvanized Pump Chain...℔ lb 5½¢ @ 6¢
Jack Chain, Iron...dis 75 @ 75&5 %
Jack Chain, Brass...dis 70&10 @ 70&10&5 %

Chalk.
White...℔ gro 55¢
Red...℔ gro 75¢
Blue...℔ gro 90¢
White Crayons...℔ gro 12¢ @ 13¢

Chalk Lines.—See Lines.

Chisels.
Socket Framing and Firmer...dis 80 %
Douglass & Witherby...dis 75 @ 75&5 %
Socket Framing and Firmer, Buck Bros...dis 30 %
Socket Framing and Firmer, Merrill...dis 60&10&10 %
Socket Firmer, Framing, &c., L. & I. J. White..dis 25&5 %
Socket Framing Firmer &c., Crossman...dis 65&5 %
Tanged Firmers...dis 50 @ 50&5 %
Tanged Firmers, Butcher's...$4.75 @ $5.00
Tanged Firmers, Spear & Jackson's...$5.00 to £
Tanged Firmers, Buck Bros...dis 30 %

Clamps.
Providence Tool Co.'s Wrought Iron...dis 25 %
Adjustable, Gray's...dis 20 %
Adjustable, Lambert's...dis 20 %
Adjustable, Snow's...dis 40&5 %
Adjustable, Hammer's...dis 15 %
Adjustable, Stearns'...dis 20&10 %
Cabinet, Sargent's...dis 70&10 %
Carriage Makers', Sargent's...dis 70&10 %
Ebernard Mfg. Co...dis 40&5 @ 40&10 %
Warner's...dis 40&10 %
Saw Clamps...See Vises

Clips.
Axle and Spring Bar, Norway Iron...dis 65 %
Wrought-Iron Felloe Clips...℔ lb 5½¢
Steel Felloe Clips...℔ lb 5¢

Coal Hods.
Sidney Shepard & Co.'s list...dis 45 %
Iron Clad Mfg. Co.'s and / Central Stamping Co.'s } list...dis 70 %
Whiting & Co., Japanned...dis 70 %
Whiting & Co., Galvanized...dis 70&5 %

Coal Vases.
Buffalo Palace, S. S. & Co...dis 33⅓&10&10 %
Buffalo Common, S. S. & Co...dis 33⅓&10&10 %

Cockeyes...dis 50 %

Cocks, Brass.
Racking...dis 65&5 %
Globe...dis 65&5 %
Plain Bibbs...dis 60&5 %
Ale and Beer...dis 60&5 %

Coffee Mills.
Board and Box...dis 40&10&2 @ 45&10&2 %
Selsor's Patent...$9.50, $10.50, dis 25 %
American, Enterprise Mfg. Co...dis 20&10@30 %
The "Swift," Lane Bros...dis 20&10 %
Webb's Patent...dis 45 %

Compasses, Dividers, &c.
Compasses...dis 60&10&10 %
Calipers...dis 60&10&10 %
Dividers...dis 60&10&10 %
Bemis & Call Co.'s Dividers...dis 60&5 %
Bemis & Call Co.'s Compasses & Calipers...dis 50&5 %
Bemis & Call Co.'s Wing & Inside or Outside.dis 50&5 %
Bemis & Call Co.'s Double...dis 60 %
Bemis & Call Co.'s (Call's Patent Inside)...dis 30 %
Excelsior...dis 50 %
Cook's Extension...dis 25 @ 25&10 %
J. Stevens & Co.'s Calipers and Dividers...dis 25&10 %

Coopers' Tools.
Bradley's...dis 20 %
Barton's...dis 20@20&5 %
L. & I. J. White...dis 20&5 %
Albertson Mfg. Co...dis 25 %
John Beatty & Co...dis 33⅓ %

Corkscrews.
Humason & Beckley Mfg. Co...dis 40 %
Clough's Patent...dis 33⅓ @ 33⅓&5 %
Howe Pros. & Hulbert...dis 35 %

Corn Knives and Cutters.
Bradley's...dis 10 %
Wadsworth's...dis 25 %

Cradles.
Grain...dis 40&5&2 %

Crow Bars.
Cast Steel...℔ lb 3¼@3⅝¢
Iron, Steel Points...℔ lb 3¼@3⅜¢

Curry Combs.
Fitch's...dis 50&10 %
Rubber...℔ doz $10.00, dis 25 @ 30 %

Curtain Pins.
Silvered Glass...net
White Enamel...net

Cutlery.
Beaver Falls and Booth's...dis 33⅓ %
Goodell Co., Table...dis 35 @ 40 %
Wostenholme...$7.75 @ $8.00 to £

Dividers.—See Compasses.

Dog Collars.
Embossed Gilt, Pope & Stevens' list...dis 30&10 %
Leather, Pope & Stevens' list...dis 40 %
Brass, Pope & Stevens' list...dis 40 %

Door Springs.
Torrey's Rod, regular size...℔ doz $1.45 @ $1.50
Gray's...℔ gro, $20.00, dis 20 %
Bee Rod...℔ gro, $20.00, dis 20 %
Warner's No. 1, ℔ doz, $2.50; No. 2, $3.30...dis 40&10 %
Gem (Coil):
No. 1, Large Japanned...℔ doz $4.00 / No. 2, Medium, Japanned...℔ doz 2.75 / No. 3, Small, Japanned...℔ doz 2.00 } dis 50&10 %
Star (Coil)—For Cop'd, Nickel-Plated, &c., see list.
No. 4, ("Shoo Fly") Screen Door size, ℔ doz $1.50 / No. 5, Screen Door size...℔ doz 2.00 / No. 6, Medium...℔ doz 2.75 / No. 7, Large...℔ doz 4.00 } dis 60 %
Victor (Coil)...dis 50&10&10 %
Champion (Coil)...dis 50&10 @ 50&10&10 %
Philadelphia...5 in., $5.00; 8 in., $7.75, dis 30 %
Cowell's...No. 1, ℔ doz $18.00; No. 2, $15.00, dis 50 %
Rubber, complete...℔ doz $2.25, dis 20&10 %
Hercules...dis 50 %
Shaw Door Check and Spring...dis 25 @ 30 @ 35 %
Elliott's Door Check and Spring...dis 25 %

Drawing Knives...dis 80 %
Douglass & Witherby...dis 75 @ 75&5 %
Merrill...dis 60&10&10 %
Watrous...dis 15&10 %
L. & I. J. White...dis 20&5 %
Bradley's...dis 35 %
Adjustable Handle...dis 20 @ 25 %

Drills and Drill Stocks.
Blacksmiths'...each, $1.60 @ $1.70
Blacksmiths' Self-Feeding...each, $7.50, dis 20 %
Breast, P. S. & W...dis 40&10 %
Breast, Wilson's...dis 30&5 %
Breast, Millers Falls...each, $3.00 dis 25 %
Breast, Bartholomew's...each, $2.50, dis 25&10 @ 40 %
Ratchet, Merrill's...dis 20 %
Ratchet, Ingersoll's...dis 25 %
Ratchet, Parker's...dis 20 @ 20&5 %
Ratchet, Whitney's...dis 20&10 %
Ratchet, Weston's...dis 20@25 %
Ratchet, Moore's Triple Action...dis 25 @ 30 %
Whitney's Hand Drill, Plain, $11.00; Adjustable, $12.00...dis 20&10 %
Wilson's Drill Stocks...dis 10 %
Automatic Boring Tools...each, $1.75 @ $1.85

Drill Chucks.
Morse's Beach Patent...each, $8.00, dis 20 %
Morse's Adjustable...each, $7.00, dis 20 @ 20&5 %
Danbury...each, $8.00, dis 30 @ 30&5 %

Dripping Pans.
Per lb...5¢ @ 5½¢

Egg Beaters.
Dover...℔ doz., $2.50
National...℔ doz $4.50, dis 33⅓ %
Family (T. & S. Mfg. Co.)...℔ gro, $17.00@$18.00
Standard...℔ gro, $12.00
Kingston...℔ gro, $9.00
Acme...℔ gro, $8.00
Triumph (T. & S. Mfg. Co.)...℔ gro, $10.50@$11.50
Advance No. 1...℔ gro $10.50
Advance, No. 2...℔ gro $10.00
Bryant's...℔ doz $2.00, dis 25 %
Ayres' Spiral...℔ gro $5

Emery.
Regular numbers...℔ lb 7¢
Flour and F. F...℔ lb 6½¢
For Emery Paper and Cloth, see Sand Paper.

Enameled and Tinned Ware.—See Hollow-Ware.

Escutcheon Pins.
Iron and Brass, list Nov. 11, 1885...dis 50&10 %

Escutcheons.
Door Lock...Same discounts as Door Locks
Brass Thread...dis 60 @ 60&10 %
Wood...dis 25 %

Faucets.
Fenn's...dis 40 %
Bohren's Patent Rubber Ball...dis 25 %
Fenn's Cork Stops...dis 33⅓ %
Star...dis 60 @ 60&5 %
Frary's Patent Petroleum...dis 33⅓&10 %
West's Patent Key...dis 50 %
Anchor Lock...dis 45 %
Metallic Key, Leather Lined...dis 55&10 @ 60&10 %
Cork Lined...dis 70 @ 70&10 %
J. Sommer's Best Block Tin Key...dis 40 %
J. Sommer's Cork Lined, 1st quality...dis 50 %
J. Sommer's Diamond Lock...dis 40 %
Self-Measuring, Enterprise...℔ doz $36.00—dis 20&10 %
Self-Measuring, Lane's...℔ doz $36.00—dis 25&10 %
Self-Measuring, Victor...℔ doz $36.00—dis 25&10 %

Felloe Plates...℔ lb 6½¢ net

Files.
Best Domestic, according to brand.dis 60@60&10&5 %
Lower Grade domestic Files...dis 70 @ — %
New Am. File Co., Pat. Tapers, special list...dis 50 %
J. B. Smith Co. Screw Tang, special list...dis 60 %
J. B. Smith Co. Horse and Wood Rasps...dis 50&10 %
J. & Riley Carr...New list, April 1, 1883, dis 15 %
J. & Riley Carr Horse Rasps...dis 10 %
Moss & Gamble...New list, dis 15 %
Butcher...New list, dis 20 %
Stubs...dis 25 @ 30 %

Fluting Machines.
Knox, 4½-inch Rolls...$3.25 each / Knox, 6-inch Rolls...$3.60 each } dis 35 %
Eagle, 3½-inch Roll...$2.15, dis 35 %
Eagle, 5½-inch Roll...2.85, dis 35 %
Crown, 4½ in., $3.50; 6-in, $4.00; 8-in., $6.50 each, dis 35 %
Crown Jewel...6-in., $3.50 each, dis 35 %
American, 5-in., $3; 6-in., $3.40; 7-in., $4.50 each, dis 35 %
Domestic Fluter...$1.50 each, net
Geneva Hand Fluter, White Metal...℔ doz $12, dis 25 %
Crown Hand Fluter, Nos. 1, $15; 2, $12.50; 3, $10.00, ℔ doz...dis 30 %
Shepard Hand Fluter, No. 85...℔ doz $15.30, dis 40 %
Shepard Hand Fluter, No. 110...℔ doz $11, dis 40 %
Shepard Hand Fluter, No. 95...℔ doz $8, dis 40 %
Clark's Hand Fluter...℔ doz $15.00, dis 33⅓ %
Combined Fluter and Sad Iron...℔ doz $15.00, dis 30 %
Buffalo...℔ doz $10.00 dis 10 %

Fluting Scissors...dis 45 %

Forks.
Hay, Manure, &c., Asso. list..dis 60&10&5@60&10&10 %
Hay, Manure, &c., Phila. list...dis 60 @ 60&5 %
Plated, see Spoons.

Freezers.—See Ice-Cream Freezers.

Fruit and Jelly Presses.
Enterprise Mfg. Co...dis 20&10 @ 33⅓ %

Fry Pans.
Central Stamping Co.'s list...dis 33⅓&2 @ — %

No	0	1	2	3	4	5	6	7	8
℔ doz	$1.50	1.75	2.00	2.25	2.50	2.75	3.25	3.75	4.25

Sidney Shepard & Co...dis 40&2 %
"Acme"...dis 60 %
Iron Clad Mfg. Co.'s list...dis 70 %

No	0	1	2	3	4	5	6	7	8
℔ doz	$3.00	3.75	4.25	4.75	5.25	6.00	7.00	8.00	9.00

Gauges.
Marking...dis 60&10 %
Wire...dis 10&10 %
Wire, Wheeler, Madden & Co...dis 10 %

Gimlets.
Nail and Spike...dis 50&10&5 %
"Eureka" Gimlets...dis 40&10 %
"Diamond" Gimlets...dis 40&10 %
Double Cut, Shepardson's...dis 45 %
Double Cut, Ives'...dis 50 %
Double Cut, Douglass'...dis 40 %
"Bee"...℔ gross $12, dis 25 %

Glue Pots.
Tinned and Enameled...dis 40&5@40&10 %
Family, Howe's "Eureka"...dis 40 %
Family, L. F. & C.'s "Handy"...dis 45 %

Grindstone Fixtures.
Sargent's Patent...dis 70&10&10 %
Reading Hardware Co...dis 35&10 @ 35&10&10 %

Hack Saws.
Griffin's Hack Saws, complete...dis 40&10 %
Griffin's Hack Saw, Blades only...dis 40&10 %
Star Hack Saws and Blades...dis 25 %

Halters.—Covert's Pat. ¼ Jute...dis 50&10 %
Covert's Hemp Horse and Cattle Ties...dis 50&10 %
Covert's Jute Horse and Cattle Ties...dis 60 %
Meneely's Pat. Adjustable Hemp and Jute..dis 50&10 %
Meneely's Hemp and Jute Horse and Cattle Ties...dis 50&10 %

Hammers.
Maydole's...dis 15&10 %
Cheney's, new list, March, 1883...dis 20&10 %
Hartford Hammer Co.'s Nail Ham's..dis 25&5@25&10 %
Buffalo Hammer Co...dis 30 @ 35 %
C. Hammond & Son...dis 40&10 %
Humason & Beckley...dis 25 %
Verree...dis 5 %
Magnetic Tack, Nos. 1,2,3, $1.25, 1.50 and 1.75.dis 25&10 %
Nelson Tool Works...dis 40&10 %
Warner & Nobles...dis 10 %
Yerkes & Plumb, A. E. Nail...dis 40&10 %
Wilkinson's Smiths'...10½¢ @ 11¢ ℔ lb
Heavy Hammers and Sledges...dis 60&10 %

Hand Cuffs and Leg Irons.
Providence Tool Co., Hand Cuffs, $15.00 ℔ doz..dis 10 %
Providence Tool Co., Leg Irons, $25.00 ℔ doz...dis 10 %
Tower's...dis 25 %
Daley's Improved Hand Cuffs: 2 Hands, Polished, ℔ doz, $48; Nickeled, $57; 3 Hands, Polished, ℔ doz, $72; Nickeled, $84...dis 20 %

Handles.
Door or Thumb Latches.—

Nos.	0	1	2	3	4	
Per doz.	$0.90	1.00	1.18	1.35	1.50	dis 60&10&10 %

Roggin's Latches...℔ doz. 32¢ @ 37¢ net
Bronze Iron Drop Latches...℔ doz. 70¢ net
Jap'd Store Door Handles—Nuts, $1.62; Plate, $1.10; no Plate, $0.88...net
Barn Door...℔ doz. $1.40, dis 10&10 %
Wrought Chest...dis 70 %
Surface Chest...dis 70 %
Flush Chest...dis 70 %
Lifting...dis 70 %
Handles, Wood—
Saw and Plane...dis 40&10 %
Hammer and Hatchet...dis 20 %
Brad Awl...℔ gross $2.00
Hickory Firmer Chisel, assorted...℔ gross 4.50 / Hickory Firmer Chisel, large...℔ gross 5.00 / Apple Firmer Chisel, assorted...℔ gross 5.00 / Apple Firmer Chisel, large...℔ gross 6.00 / Socket Firmer Chisel, assorted...℔ gross 3.00 / Socket Framing Chisel, assorted...℔ gross 5.00 } dis 40
J. B. Smith Co.'s Pat. File...dis 50 %
File, assorted...℔ gross 2.75 / Auger, assorted...℔ gross 5.00 / Auger, large...℔ gross 7.00 } dis 33⅓ @ 40 %
Patent Auger, Ives'...dis 25 %
Patent Auger, Douglass'...℔ set $1.25 net
Patent Auger, Swan's...℔ set $1.00 net
Cross Cut Saw Handles—
Atkins' No. 1 Loop, ℔ pair, 30¢; No. 3, 25¢; No. 2 and No. 4 Reversible, 22¢.
Boynton's Loop Saw Handles...50¢, dis 60 %
Champion...15¢

Hangers.
Barn Door, old patterns...dis 60&10&10 %
Barn Door, New England...dis 60&10&10&10 %
Climax (Anti-Friction)...dis 55 %
Zenith Anti-Friction Wood Track...dis 55 %
Reed's Steel Arm...dis 40 %
Challenge...dis 50 %
"Champion" Medina Mfg Co...dis 60 %
Sterling Improved (Anti-Friction)...dis 65&10 %
Victor, No. 1, $15; No. 2, $16.50; No. 3, $18...dis 50&2 %
Cheritree...dis 50&5 %
Kidder's...dis 50&10 @ 50&15 %
U. S...dis 60&10 %
The "Boss"...dis 60 %
Best Anti-Friction...dis 60 %
Duplex (Wood Track)...dis 60 %
Terry's Patent...℔ doz. pr., 3½ in. $10; 5 in., $12...dis 40&5@40&10 %
Cronk's Patent...No. 4, $12; No. 5, $14.40; No. 6, $18...dis 50&5 @ 50&10 %
Wood Track, Iron Clad...℔ ft. 8¢, dis 50&5 @ 50&10 %
Architect...℔ set $6.00, dis 20 %
Eclipse...dis 20&10
Felix...℔ set $4.50, dis 20 %
Hamilton Wrought...dis 50 @ 50&5 %
Richards'..(lots of 50 sets dis 20&10&10 %)..dis 20&10 %
Lane's Steel Anti-Friction...dis 30&10 %
The Ball Bearing Door Hanger...dis 20&10 @ 25&10 %
Warner's Patent...dis 20@20&10 %
Stearns' Anti-Friction...dis 20 %

Harness Snaps.
Anchor (T. & S. Mfg Co.)...dis 65 %
Henshaw's, list of 1½ changed to $14.00...dis 65 %
Judd's, list of 1½ changed to $14.00...dis 65 %
Fitch's (Bristol), list of 1½ changed to $14.00...dis 65 %
Hotchkiss...dis 10 %
Andrews...dis 50 %
Sargent's Patent Guarded...dis 70&10&10 %
German, old list...dis 75 %
German, Sargent's new list...dis 60&10&10 %
Covert...dis 50 %
Covert, New Patent, new list...dis 50 %
Covered Spring...dis 66⅔&10 %
Meneely's Pat. Safety, new list...dis 60&10 %
Meneely's Pat. Guard, new list...dis 60&10 %
Meneely's Pat. Chain Link...dis 60&10 %

Hatchets.
Isaiah Blood...dis 35 @ 40 %

Shingling,	Nos. 1 2 3	℔ doz	$7.25	$8.00	$8.75
Claw,	Nos. 1 2 3	℔ doz	7.75	8.50	9.25
Lathing,	Nos. 1 2 3	℔ doz	7.50	8.00	8.50

Hunt's...40 %

Shingling,	Nos. 1 2 3	℔ doz	$7.25	$8.00	$8.75
Claw,	Nos. 1 2 3	℔ doz	7.75	8.50	9.25
Lathing,	Nos. 1 2 3	℔ doz	7.50	8.25	9.00

Hurd's...dis 40&5 @ 45 %

Shingling,	Nos. 1 2 3	℔ doz	$8.00	$8.50	$9.00
Claw,	Nos. 1 2 3	℔ doz	9.00	9.50	10.00
Lathing,	Nos. 1 2 3	℔ doz	8.00	8.50	9.00

Yerkes & Plumb...dis 40&10@40&10&5 %

Shingling,	Nos. 1 2 3	℔ doz	$7.50	$8.00	$8.50
Claw,	Nos. 1 2 3	℔ doz	8.00	8.50	9.00
Lathing,	Nos. 1 2 3	℔ doz	7.50	8.00	8.50

Underhill Edge Tool Co...dis 40 %

Shingling,	Nos. 1 2 3	℔ doz	$7.25	$8.00	$8.75
Claw,	Nos. 1 2 3	℔ doz	7.75	8.50	9.25
Lathing,	Nos. 1 2 3	℔ doz	7.50	8.25	9.00

Lathing, Solid Steel...dis 30 @ 35 %
No. 1, $12. Boston Pattern, $18.
C. Hammond & Son...dis 40&10 %

Shingling,	Nos. 1 2 3	℔ doz	$8.00	$8.50	$9.00
Lathing,	Nos. 1 2 3	℔ doz	8.00	8.50	9.00
Claw,	Nos. 1 2 3	℔ doz	8.50	9.00	9.50
Broad,	Nos. 1 2 3	℔ doz	11.00	13.50	16.00

Simmons...dis 35 @ 40 %

Shingling,	Nos. 0 1 2 3	℔ doz	$7.50	$8.00	$8.50	$9.00
Claw,	Nos. 0 1 2 3	℔ doz	....	8.50	9.00	9.50
Lathing,	Nos. 0 1 2 3	℔ doz	....	8.00	8.50	9.00
Broad,	Nos. 1 2 3 4	℔ doz	9.00	10.00	12.00	14.00
Broad,	Nos. 5 6 7 8	℔ doz	16.00	18.00	20.00	22.00

Collins...dis 10 %

Shingling,	Nos. 1 2 3	℔ doz	$5.50	$6.00	$6.50
Claw,	Nos. 1 2 3	℔ doz	6.00	6.50	7.00
Lathing,	Nos. 1 2 3	℔ doz	5.50	6.00	6.50

Peck's Champion Blade...dis 40&10 @ 40&10&5 %

Shingling,	Nos. 1 2 3	℔ doz	$8.00	$8.50	$9.00
Lathing,	Nos. 1 2 3	℔ doz	8.00	8.50	9.00
Claw,	Nos. 1 2 3	℔ doz	9.00	9.50	10.00
Half,	Nos. 1 2 3	℔ doz	8.00	8.50	9.00
Broad,	Nos. 1 2 3	℔ doz	10.00	11.00	13.00
Broad,	Nos. 4 5 6	℔ doz	14.50	16.50	18.00
Ax Pattern,	Nos. 1 2 3	℔ doz	10.00	11.00	12.00

Hay Knives.
"Lightning"...℔ doz $18, dis 10@10&10 %
Electric...℔ doz 2.50
Wadsworth's...dis 35&50 %
Heath Patent...℔ doz $13.00 @ $13.50 %
Carter's Needle...℔ doz $18, dis 10&5@10&10 %

Hinges.
Wrought Iron Hinges—
Strap and T...dis 65&10&2 % cash
Screw Hook and Strap } 8, 10, 12 in., ℔ lb...3¼@3⅜¢ / 14 to 36 in. ℔ lb...2¼@2⅜¢
Heavy Welded Hook } 8 to 12 in., ℔ lb...3¼@3⅜¢ / 14 in. & up, ℔ lb...2¼@2⅜¢
Screw Hook and Eye } ⅛ in...℔ doz $1.50 / ⅝ in...℔ doz $2.45 / ¾ in...℔ doz $3.80 } dis 10 %
Rolled Blind Hinges...dis 60&10 %
Rolled Plate...dis 70&10 %
Rolled Raised...dis 70&10 %
Plate Hinges } 8, 10 & 12 in., ℔ lb...4¢
"Providence" } over 12 in., ℔ lb...3¢
Spring Hinges—
Geer's Spring and Blank Butts...dis 33⅓ %
Union Spring Hinge Co.'s...dis 30 %
American Spring Hinge Co.'s...dis 30 %
Gem Spring Hinges...dis 30 %
Barker's Double Acting...dis 20&10 %
Union Mfg. Co...dis 25 %
Bommer's...dis 25 %
Buckman's...dis 25 %
Empire...dis 60&10 %
Acme...dis 70 %
Climax...dis 50&10 %
Chicago...dis 30 @ 30&10 %
Gate Hinges—
Western...℔ doz $4.40, dis 55 %
N. E...℔ doz $7.00, dis 55 %
N. E. Reversible...℔ doz $5.20, dis 55 %
Clark's, Nos. 1 2 3...dis 60&10&2 %
N. Y. State...℔ doz $5.00, dis 55 %
Automatic...℔ doz $12.50, dis 50 %
Common Sense...℔ doz pair $4.50, dis 50 %
Seymour's...dis 45&10 %
Shepard's, Nos. 1, 2, 10 and 20...dis 60&10&10 %
Shepard's, No. 3...dis 60&10&5 %
Reed's Latch and Hinge...℔ doz sets $12, dis 50 %

Hoes.
Handled—
Garden, Mortar, &c...dis 60&10&5 @ 60&10&10 %
Planter's, Cotton, &c...dis 60&10&5 @ 60&10&10 %
Magic...℔ doz $4.75
Eye—
Scovil and Oval Pattern..dis 60&10&5 @ 60&10&10 %
Grub...dis 60&10 @ 60&10&5 %

Hog Rings and Ringers.
Hill's Improved Ringers...℔ doz, $6.00
Hill's Old Style Ringers...℔ doz, 4.00
Hill's Tongs...℔ doz, 6.00
Hill's Rings...℔ doz boxes, 2.25
Perfect Rings...℔ doz boxes $2
Perfect Ringers...℔ doz. $3
Blair Hog Ringers...℔ doz, $1.75 @ 2.00

Hoisting Apparatus.
"Moore's" Hand Hoist, with Lock Brake...dis 15 %
"Moore's" Differential Pulley Block...dis 20 %

Hollow-Ware, Iron.
Stove Hollow-Ware, Ground...dis 50&5@50&10&5 %
Stove Hollow-Ware, Unground...dis 60@60&10 %
Enameled and Tinned Hollow-Ware—
Kettles...dis 60&5 @ 60&10&5 %
Oval Boilers, Saucepans and Glue Pots...dis 40&5@40&10 %
Gray Enameled Ware...dis 45 %
Rustless Hollow-Ware...dis 50&5@50&10 %
Galvanized Tea-Kettles—

Inch	6	7	8	9
Each	50¢	55¢	60¢	70¢

Hooks.
Cast Iron—
Bird Cage, Sargent's list...dis 66⅔&10 %
Bird Cage, Reading...dis 60&10@60&10&10 %
Clothes Line, Sargent's list...dis 70&10 %
Clothes Line, Reading list...dis 66⅔&10 %
Ceiling, Sargent's list...dis 60&10&10 %
Harness, Reading list...dis 60&10&10 %
Coat and Hat, Sargent's list...dis 60&10&10 %
Coat and Hat, Reading...dis 60&10&10 %
Wrought Iron—
Cotton...℔ doz $4.00, dis 50 %
Cotton Pat. (N. Y. Mallet & Handle W'ks)...dis 30 %
Cotton (Humason & Beckley Mfg. Co.).dis 50&10@60 %
Tassel and Picture (T. & S. Mfg. Co.)...dis 50 %
Wrought Staples, Hooks, &c...See Wrought Goods
Bench Hooks...See Bench Stops
Wire—
Wire Coat and Hat, Gem...dis 45 %
Wire Coat and Hat, Miles'...dis 70
Belt...dis 80@80&5 %
Wire Screw Hooks and Eyes..See Bright Wire Goods
Grass...℔ doz $2.00
Bush...dis 55 @ 60 %
Whiffletree—Patent...dis 55 %
Hooks and Eyes—Malleable Iron...dis 70 %
Hooks and Eyes—Brass...dis 60&10&10 %
Fish Hooks, American...dis 40&10 %

Horse Nails.

	Nos.	5	6	7	8	9	10	
Ausable	℔ lb	31¢	28¢	26¢	25¢	24¢	23¢	dis 25&10 %
Clinton, Pl'n	℔ lb		23¢	21¢	20¢	19¢	18¢	dis 25&10 %
Clinton, Fin.	℔ lb		24¢	22¢	21¢	20¢	19¢	dis 25&10 %
Essex	℔ lb	31¢	28¢	26¢	25¢	24¢	23¢	dis 40 %
Putnam	℔ lb	27¢	24¢	22¢	21¢	20¢	19¢	dis 5&7 %
Vulcan	℔ lb	26¢	23¢	21¢	20¢	19¢	18¢	dis 12½ %
Northwest'n	℔ lb	28¢	25¢	23¢	22¢	21¢	20¢	dis 10&10 %
Globe	℔ lb	26¢	23¢	21¢	20¢	19¢	18¢	dis 10&5&5 %
A. C.	℔ lb	28¢	25¢	23¢	22¢	21¢	20¢	dis 10&10&5 %
C. B.-K.	℔ lb	28¢	25¢	23¢	22¢	21¢	20¢	dis 10&10 %
Champlain	℔ lb	31¢	28¢	26¢	25¢	24¢	23¢	dis 25&10 %
New Haven	℔ lb	31¢	28¢	26¢	25¢	24¢	23¢	dis 25&10 %
Bridgewater	℔ lb	26¢	23¢	21¢	20¢	19¢	18¢	dis 30 %
Saranac	℔ lb	26¢	23¢	21¢	20¢	19¢	18¢	dis 25 @ 30 %
Champion	℔ lb	28¢	25¢	23¢	22¢	21¢	20¢	dis 10&10&5 %
Capewell	℔ lb	31¢	28¢	26¢	25¢	24¢	23¢	dis 35&5 %
Star	℔ lb	26¢	23¢	21¢	20¢	19¢	18¢	dis 10&10 %

NOTE.—Concessions on above quotations are frequently made to careful buyers.

Horse Shoes—Burden, at factory...℔ keg $3.60
R. I. Horse Shoe Co., Perkins' Imp., at factory...℔ keg $3.60
Walker's Forged...℔ keg $3.60
Mule Shoes, at factory...℔ keg $4.60

Hose, Rubber...70 @ 70&5 %
N. Y. B. & P. Co., Standard...dis 50&10@50&10&5 %

Ice Awls, Chisels, &c.
American Ice Chisel Pol'd...℔ doz $3.00, dis 20 %
National Ice Chisel...℔ doz $6.25, dis 20 %
Novelty Ice Breakers...℔ doz $6.25, dis 20 %
White's Sliding Head Picks...℔ doz $2.50, dis 40 %
Dunlap's Ring Picks...℔ doz $2.00, dis 25 %
Wood Head Picks, Sargent's...℔ doz $1.60, dis 50&10 %
Iron Head Picks, Sargent's...℔ doz $1.25, dis 50&10 %
Ice Mallets, Pick in handle...℔ doz $2.00, dis 15 %
Ice Axes, Small Cast or Mall...℔ doz $1.25, dis 20&10 %
Combination Ice Tools...℔ doz $2.00 net
Acme Ice Pick and Tongs...℔ gross $55.00, dis 50&10

Ice Cream Freezers.
Buffalo Champion, S. S. & Co...dis 60&2

Ice Tongs.
Champion, S. S. & Co...℔ doz $4.00, dis 25&10 %
Family...℔ doz $2.75, dis 20 %

Jack Screws.
Millers Falls list...dis 50 %

Kettles.
Brass, 7 to 17 in. inclusive...℔ lb 20¢ Net
Brass larger than 17 inches...℔ lb 22¢ Net
Enameled and Tea Kettles...See Hollow-Ware

Keys.
Eagle, Cabinet, Trunk and Padlock...dis 40&2 %
Hotchkiss' Brass Blanks...dis 40 %
Hotchkiss' Copper and Tinned...dis 40 %
Hotchkiss' Padlock and Cabinet...dis 35 %

Knives.
Ames' Butcher Knives...dis 25 %
Nichols' Butcher Knives...dis 40&10 %
Ames' Shoe Knives...dis 20 %
Ames' Bread Knives...℔ doz $1.50, dis 15 @ 20 %
Moran's Shoe and Bread Knives...dis 20 %
Goodell Co., Butcher, Shoe, Bread, &c...dis 40 %
Hay and Straw...See Hay Knives
Table and Pocket...See Cutlery

Knobs.
Door Mineral...℔ doz., 68@70¢
Door Por. Jap'd...℔ doz., 77¢ @ 80¢
Door Por. Por...℔ doz $2.55 @ $2.70
Door Por. Plated...℔ doz., $2.40@$2.50
Hemacite Door Knobs, new list...dis 35&5@35&10 %
Furniture Plain...75¢ gross inch. dis 10 %
Furniture, Wood Screws...dis 25&10 %
Base, Rubber Tip...dis 70&10&5 %
Picture, Judd's...dis 60&10&10 %
Picture, Sargent's...dis 70&10 %
Picture, Hemacite...dis 35&5 %
Shutter, Porcelain...dis 65&10 %
Carrriage, Japanned...℔ gross 80¢, dis 60&10 %

Ladles.
Melting, Sargent's...dis 60&10 %
Melting, Reading...dis 40&10 %
Melting, Monroe's Patent...℔ doz. $4.00, dis 40 %
Melting, P. S. & W...dis 35 @ 35&10 %
Melting, Warner's...dis 30 %

Lanterns.
Tubular, Standard No. 0, ℔ doz...$6.75 @ $7.00
Tubular, Standard No. 1, ℔ doz...8.50 @ 8.75
Tubular, Lift Wire, No. 0, ℔ doz...8.50
Tubular, Lift Wire, No. 1, ℔ doz...10.00
Guards for Tubulars, add ℔ doz...25
Police, Small, $6.00; Medium, $7.25; Large, $9.75...dis 10@15 %
Porter's Tin R. R...$10 dis 20 %
Owl...$9, dis 20@25 %

Lemon Squeezers.
Porcelain Lined...℔ doz. $6.00, dis 35&5 %
Wood...℔ doz. $3.00, dis 35 %
Eureka, Tinned...℔ doz. $8.00, dis 10 %
Dunlap's Improved...℔ doz. $3.75, dis 20 %
Sammis'...No. 1, $5; 2, $9; 12, $18 ℔ doz. .dis 25&10 %
Townsend's Patent...$6.00 ℔ doz., dis 33⅓ %
Jennings' "Star"...$3.00 ℔ doz. net
The "Boss"...℔ doz. $4.00, dis 10&10 %
Dean's Nos. 1, ℔ doz. $15.00; 2, $8.00; 3, $5.50...dis 55 %
Little Giant...dis 50 %
Acme...℔ gross $55.00, dis 50 %

Lines.
Cotton and Linen Fish, Draper's................dis 50 %
Draper's Chalk..dis 60 %
Draper's Mason's Linen, 84 ft., No. 1, $1.2‥; No. 2, $1.75; No. 3, $2.25; No. 4, $2.75; No. 5, $3.25..dis 25 %
Cotton Chalk..dis 55 %
Silver Lake, Braided, Nos. 0, $6.00; No. 1, $6.50; No. 2, $7.00; No. 3, $7.50 ℔ gross........................dis 25 %
Masons' Linen, No. 3½, $1.50; No. 4, $2; No. 4½, $2.50
Masons' Colored Cotton................................dis 45
Wire Clothes, No. 18, $3.35 @ $3.60; No. 19, $2.75 @ $3; No. 20, $2.25 @ $2.50.

Locks, Padlocks, Cabinet Locks &c.
Door Locks, Latches, &c.—
List, Dec. 10, 1884. Some numbers changed Feb. 5, 1885 } dis 66⅔&2 @ 66⅔&10&2 %
The Locks named below are often sold at net figures:
Horizontal Rim Knob Latches, 3¾x2⅛ in., Iron Bolt and Hub....................℔ doz., $0.75
Horizontal Rim Knob Latches, 3¾x2⅛ in., Iron Bolt and Slide Bolt, Iron Hub....℔ doz., 1.10
Mortise Knob Locks, 3½x3 in., Iron Bolt, Tinned Key............................℔ doz., 1.10
Horizontal Rim Closet Locks, 2⅞x1⅞ in., Iron Bolt and Key........................℔ doz., .75
Horizontal Rim Closet Locks, 3½x2⅛ in., Iron Bolt, Tinned Key........................℔ doz., .85
Horizontal Rim Closet Locks, 4x2⅛ in., Iron Bolt, Tinned Key.........℔ doz., $1.00 @ 1.05
Upright Rim Knob Locks, 4x3 in., Iron Bolts, Iron Hub, Tinned Key..℔ doz., $1.00 @ 1.05
Upright Rim Knob Locks, 4x3 in., Iron Bolts, Iron Hubs with Stop, Tinned Keys..........................℔ doz., $1.05 @ 1.10
Upright Rim Knob Locks, 4½x3⅜ in., Iron Bolts and Hub, Tinned Key, ℔ doz....................................$1.00 @ 1.15
Upright Rim Knob Locks, 4½x3⅜ in., Iron Bolts and Hub with Stop, Tinned Key........................℔ doz., $1.15 @ 1.20
Upright Rim Knob Locks, 4½x3⅜ in., Iron Bolts and Thumb Bolt, Tinned Key..........................℔ doz., $1.35 @ 1.40
Horizontal Rim Knob Locks, 4½x3⅜ in., Iron Bolts and Hub with Stop, Tinned Key..........................℔ doz., $1.10 @ 1.15
Horizontal Rim Knob Locks, 4½x3⅜ in., Iron Bolts and Thumb Bolt, Tinned Key..........................℔ doz., $1.35 @ 1.40
Nimick & Brittan's Burglar-Proof Locks.. dis 70&2 %
Reading Hardware Co. (list Feb. 2, 1885)....dis 70 %
Perkins' Burglar Proof.........................dis 60&25 %
Plate...dis 33⅓&2 %
F. Many's "Extension Cylinder"....$10.50 ℔ doz net
Barnes Mfg. Co...................................dis 40 %
Yale Flat Key......................................dis 40 %
Dietz Flat Key......................................dis 20 %
L. & C. Round Key Latches....................dis 40&10
L. & C. Flat Key Latches.....................dis 33⅓&10 %
Yale new list...dis 40 %
"Shepardson" or "U. S."........................dis 35 %
"Felter" or "American"......................dis 40&10 %

Cabinet—
Eagle, Gaylord, Parker, Corbin — Changes made in list price of some numbers March 10, 1884, and Jan. 1, 1885 dis 40&2 % cash.
A. E. Deits.....................................dis 30@40 %
Stoddard Lock Co...............................dis 30 %
A. E. Deitz, Flat Key Drawer..............dis 30@40 %
"Champion" Night Latches.....................dis 40 %
Yale...dis 40 %
Barnes Mfg. Co...................................dis 40 %
Eagle and Corbin Trunk......................dis 25&2 %
"Champion" Cabinet and Combination....dis 33⅓ %
Romer's...dis 25 %

Padlocks—
Russell & Erwin, Mallory, Wheeler & Co., Nimick & Brittan Mfg. Co., Wm. Wilcox & Co., Norwich Lock Co. — New list Dec. 23, 1884. Dis 66⅔&2@—, but prices are very irregular
Yale Lock Mfg. Co.'s.............................dis 40 %
Eagle...dis 25&2 %
Eureka, Eagle Lock Co........................dis 40&2 %
Romer's, Nos. 0 to 91............................dis 40 %
Romer's, Nos. 200 to 505.......................dis 25 %
A. E. Dietz..dis 35 %
"Champion" Padlocks..........................dis 33⅓ %
Hotchkiss..dis 30 %
"Star"..dis 45 %
"Horse Shoe," ℔ doz., $9......................dis 40 %
Barnes Mfg. Co....................................dis 40 %
Nock's..dis 30 %
Brown's Patent......................................dis 25 %
Scandinavian.......................................dis 90 %
Fraim's Pat. Scandinavian, new list (low)....dis 60 %

Lumber Tools.
Ring Peavies, "Blue Line" Finish.........℔ doz $20.00
Ring Peaves, Common Finish...............℔ doz $18.00
Steel Socket Peavies...........................℔ doz $21.00
Mall. Iron Socket Peavies.....................℔ doz $19.00
Cant Hooks, "Blue Line" Finish..............℔ doz $16.00
Cant Hooks, Common Finish...................℔ doz $14.00
Cant Hooks, Mall. Socket Clasp, "Blue Line" Finish..℔ doz $16.00
Cant Hooks, Mall. Socket Clasp, Common Finish..℔ doz $14.50
Cant Hooks, Clip Clasp, "Blue Line" Fin. ℔ doz $14.00
Cant Hooks, Clip Clasp, Common Finish..℔ doz $12.00
Band Spikes..................℔ doz 6 ft., $15.00; 8 ft., $20

	12 ft.	14 ft.	16 ft.	18 ft.	20 ft.
Pike Poles, Pike & Hook, ℔ doz.	$11.50	12.50	14.50	17.50	21.50
Pike Poles, Pike only, ℔ doz.	10.00	11.00	13.00	16.00	20.00
Pike Poles, not Ironed, ℔ doz.	6.00	7.00	9.00	12.00	16.00
Setting Poles, ℔ doz.	14.00	15.00	17.00	....	....

Swamp Hooks......................................℔ doz $18.00
Landing Blocks....................................℔ doz $22.50
Skidding Tongs....................................℔ doz $51.00
Log Binders..℔ doz $26.00
Bended Boot Calks, 1 to 5 M, dis 25 %; 5 to 10 M, dis 30 %
Square Steel Boot Calks........................dis 40 %
Chain Rafting Dogs...............................℔ 100 $12.50
Ring Rafting Dogs...℔ 100, med., $10.00; large, $12.00
Timber Grapples.................................℔ doz $30.00

Lustro.
Four-ounce bottles.......℔ doz, $1.75; ℔ gro. $17.00 net

Mallets.
Hickory...dis 10&10&5 %
Lignumvitæ.......................................dis 10&10&5 %
Penfield Block Co., Lignumvitæ and Hickory..dis 30 %

Mattocks.
Regular list.............................dis 60&10@60&10&5 %

Meat Cutters.

Dixon's—Nos.	1	2	3	4			
℔ doz.	$14.00	17.00	19.00	30.00—dis 45 @ 45&5 %			
Woodruff's.....Nos.	100	150					
℔ doz.	$15.00	18.00—dis 45@45&5 %					
Champion.....Nos.	200	800	400				
℔ doz.	$22.00	27.00	40.00—45@45&5 %				
Hales'.....Nos.	11	12	13				
℔ doz.	$27.00	33.00	45.00 } dis 60&10&10 @ 70 %				
American.....dis 35 %							
Nos.	1	2	3	4B			
Each	$5.00	7.00	10.00	25.00	50.00	60.00	
Enterprise.....dis 30 %							
Nos.	10	12	22	32	42		
Each	$3.00	2.50	4.00	6.00	10.00		
Pennsylvania.....dis 40&10 %							
Nos.	1	2	3	00			
℔ doz.	$24.00	28.00	36.00	28.00			
Miles' Challenge..Nos.	1	2	3				
℔ doz.	$22.00	30.00	40.00—dis 45@45&5 %				

Kieser's No. 55..................$40 ℔ doz, dis 40 @ 40&5 %
Kieser's Gem......................$25 ℔ doz, dis 40 @ 40&5 %
Kieser's Monarch.................$45 ℔ doz, dis 40 @ 40&5 %
Kieser's Butcher.................$40 each, dis 20 @ 20&5 %
Draw Cut..Nos. 5 2 6 8 10
Each..$50.00 75.00 80.00 225.00 400.00—dis 20 %
Beef Shavers (Enterprise Mfg. Co.)..........dis 20&10 %
Chadborn's Smoked Beef Cutter...........℔ doz, $66.00

Mincing Knives.
Am. (2d quality), ℔ gro, 1 blade, $7; 2 blades, $12; 3 blades, $18.......................................Net
Lothrop's..dis 20&10 %
Smith's, ℔ doz, Single, $2.00; Double, $3....dis 40@45 %
Knapp & Cowles.....................................dis 60 %

Molasses Gates.
Stebbins' Pat's..........................dis 75&5 @ 75&10 %
Stebbins' Genuine.........................dis 70&7½&10 %
Stebbins' Tinned Ends...........................dis 60&10 %
Chase's Hard Metal..............................dis 50&10 %
Bush's..dis 20 %
Lincoln's Pattern.................................dis 70&10 %
Weed's...dis 20&10 %
Boss Nos.. 1 2 3 4
$7.00 8.00 9.00 10.00..℔ doz, dis 60&10&10 %

Money Drawers.—℔ doz., $18.
Wire Carpet Nails............................See Tacks

Nails..See Trade Report
Wire Nails, list Nov. 11, 1885.............dis 50&10 %

Nail Puller.
Curtiss Hammer..............................℔ doz $9.00 net
Giant, No. 1.................................℔ doz $30.00, dis 10 %
Pelican...℔ doz $9.00, dis 25 %

Nuts and Washers.
Square Nuts..9¼¢ off list
Hexagon..10½¢ off list
Washers.................................9½¢ @ 10¢ off list
In lots less than 100 ℔, ℔ ℔ add ½¢ to list 1 ℔ boxes, 1¢ to list.

Nut Crackers.
Table (Humason & Beckley Mfg. Co.)..............dis 40 %
Blake's Pattern..........................℔ doz $2.00, dis 10 %
Turner & Seymour Mfg. Co.....................dis 50 %

Oakum.
Government.......................................℔ ℔ 7¼@7½¢
U. S. Navy...℔ ℔ 6¾@7 ¢
Navy..℔ ℔ 5¾@6 ¢

Oilers.
Zinc and Tin..................................dis 65&65&5 %
Brass and Copper...............................dis 50&10 %
Malleable (Hammer's), No 1, $3.60; No. 2, $4.00; No. 3, $4.40 ℔ doz.....................dis 10 @ 10&10 %
Prior's Patent or "Paragon" Zinc dis 60&5 @ 60&10 %
Prior's Patent or "Paragon" Brass.................dis 50 %
Olmstead's Tin and Zinc.............................dis 60 %
Olmstead's Brass and Copper........................dis 50 %
Broughton's Zinc.......................................dis 60 %
Broughton's Brass......................................dis 50 %

Packing, Steam.
N. Y. Belting & Packing Co......dis 50 @ 50&10 %
American Packing.......................................11¢
Russia Packing..14¢
Italian Packing...................................15 @ 16¢
Cotton Packing...................................15 @ 18¢

Padlocks.—See Locks.

Pails, Galvanized Water.

Quarts	10	12	14
Hill's Light Weight, ℔ doz.	$2.75	3.00	3.25
Hill's Heavy Weight, ℔ doz.	3.00	3.25	3.75
Whiting's	2.75	3.00	3.25
Fire Buckets	2.75	3.25	3.50

Buckets, see Well Buckets.

Pencils
Faber's Carpenters'......................high list, dis 50 %
Faber's Round Gilt............................℔ gro $5.25 net
Dixon's Lead.....................................℔ gro $4.50 net
Dixon's Lumber..................................℔ gro $6.75 net
Dixon's Carpenters'............................dis 40&10 %

Picks.
Railroad, 5 to 6, $11.00; 6 to 7, $12.dis60&10@60&10&5 %
Adze Eye, 5 to 6, $12.00; 6 to 7, $13.dis60&10@60&10&5 %

Picture Nails.
Brass Head, Sargent's list..........dis 50&10&10&10 %
Brass Head, Combination list...............dis 50&10 %
Porcelain Head, Sargent's list...........dis 50&10&10 %
Porcelain Head, Combination list...........dis 40&10 %
Niles' Patent...dis 40 %

Pinking Irons............................℔ doz 65¢ net

Pipe, Wrought Iron.
1¼ and under, Plain.................................dis 42½ %
1¼ and under, Galvanized.........................dis 32½ %
1½ and over, Plain...................................dis 60 %
1½ and over, Galvanized...........................dis 42½ %

Planes and Plane Irons.
Wood Planes—
Molding....................dis 15&2 %
Bench, First Quality....dis 20&2 %
Bench, Second Quality..dis 25&2 %
} Small extras sometimes given by jobbers
Iron Planes—
Bailey's (Stanley R. & L. Co.)...............dis 20&10 %
The Stanley (S. R. & L. Co.)...................dis 20&10 %
Bailey's "Victor".................................dis 20&10 %
Steer's Iron Planes.................................dis 35 %
Meriden Mal. Iron Co.'s Iron Planes........dis 20&10 %
Davis's Iron Planes..............................dis 20&10 %
Plane Irons—
Plane Irons..dis 20&10 %
Plane Irons, Butcher's....................$5.00 @ $5.25 to £
Plane Irons, Buck Bros.............................$5.00 to £
Plane Irons, Middlesex Mfg. Co., "Baldwin Iron"....................................dis 33⅓ %
L. & I. J. White.....................................dis 25 %

Pliers and Nippers.
Button's Patent..........................dis 30&10 @ 40 %
Hall's Pat. Compound Lever Cutting Nippers, No. 2, 5 in., $13.50; No. 4, 7 in., $21.00 ℔ doz.....dis 20&10 %
Humason & Beckley Mfg. Co.......................dis 50 %
Gas Pliers...dis 60 %
Eureka Pliers and Nippers.........................dis 40 %
Russell's Parallel....................................dis 25 %
P. S. & W. Cast Steel..............................dis 50 %
P. S. & W. Tinners' Cutting Nippers....add 6 % dis 10 %

Plumbs and Levels.
Standard List...........................dis 70&10@70&10&10 %
Disston's...dis 45&10 %
Pocket Levels............................dis 70&10@70&10&10 %
Davis' Inclinometers...............................dis 10&10 %

Post Hole and Tree Augers and Diggers.
Samson Post Hole Digger.....℔ doz $36.00, dis 20&10 %
Fletcher Post Hole Augers....℔ doz $36.00, dis 20 %
Eureka Diggers..................................℔ doz $18 @ $20
Leed's..℔ doz $9.00 @ $9.50
Vaughan's Hollow Tube Post Hole..............per doz, $24.00.............................dis 33⅓ @ 20&10&10 %
Kohler's Little Giant..................................℔ doz $24
Kohler's Hercules.................................℔ doz $18.00
Kohler's New Champion........................℔ doz $10.00
Schneidler.............................℔ doz $24, dis 2 % cash
Ryan's Post Hole Diggers..........................℔ doz $24
Cronk's Post Bars.........℔ doz $60, dis 50&5 @ 50&10 %

Potato Parers.
White Mountain.....................................℔ doz $5.50
Antrim Combination...............................℔ doz $8.00
Hoosier..℔ doz $13.50

Pruning Hooks and Shears.
Disston's Combined Pruning Hook and Saw ℔ doz $18.00...dis 20&10 %
Disston's Pruning Hook.......℔ doz $12.00, dis 20&10 %
E. S. Lee & Co.'s Pruning Tools.....................dis 40 %
Pruning Shears....................℔ doz $3.75 @ $4.00 net
Henry's Pruning Shears.......................℔ doz $4.50 net
Wheeler, M. & Co.'s Combination....℔ doz $12, dis 20 %
Dunlap's Saw and Chisel...............℔ doz $8.50, dis 30 %
J. Mallinson & Co., A. & B. Co. list..................dis 33⅓ %

Pulleys.
Hot House, Awning, &c.........................dis 66⅔&10 %
Japanned Screw....................................dis 66⅔&10 %
Brass Screw..dis 70&10 %
Japanned Side.......................................dis 66⅔&10 %
Japanned Clothes Line..............................dis 60&10 %
Hay Fork, Solid Eye, $4.00; Swivel, $4.50 { dis 50&10 @ 50&10&5 %
Hay Fork, "Anti-Friction," 5 in. Solid, $5.70...dis 50 %
Hay Fork, "F" Common and Pat. Bushed.....dis 20 %
Hay Fork, Tarbox Pat. Iron..........................dis 20 %
Shade Rack...dis 45 %
Tackle Blocks..See Blocks

Pumps.
Cistern, Best Makers.................................dis 50 %
Pitcher Spout, Best Makers.........................dis 60 %
Pitcher Spout, Cheaper Goods..............dis 70 @ 70&5 %

Punches.
Saddlers' or Drive, good quality.........℔ doz 70¢ @ 75¢
Bemis & Call Co.'s Cast Steel Drive.............dis 50&5 %
Bemis & Call Co.'s Springfield Socket............dis 50&5 %
Spring, good quality.......................℔ doz $2.50 @ $2.60
Spring, Leach's Patent..................................dis 15 %
Bemis & Call Co.'s Spring and Check.............dis 40 %
Solid Tinners'...............................℔ doz $1.44, dis 55 %
Tinners' Hollow Punches...........................dis 20&2 %

Rail.
Sliding Door, Wrought Brass ℔ ℔ 35¢, dis 20@25 %
Sliding Door, Bronzed Wrt. Iron...............℔ foot 7¢
Sliding Door Iron, Painted....℔ foot 4¢, dis 20&10&5 %
Barn Door, Light....Inch. ⅝ ¾ ⅞
Per 100 feet............$2.50 3.00 4.40—dis 10 %
B. D. for N. E. Hangers— Small. Med. Large
Per 100 feet.............$2.15 2.70 2.25 net
Ferry's Wrought Iron, 5¢ ℔ foot............................net
Victor Track Rail, 7¢ ℔ foot......................dis 50&2 %

Rakes.
Cast Steel................................dis 60&10 @ 60&10&10 %
Malleable................................dis 60&10 @ 60&10&10 %

Razors.
J. R. Torrey Razor Co...................................dis 20 %
Wostenholme & Butcher.....................$10 to £, dis 10 %

Razor Strops.
Genuine Emerson.......................................dis 60 %
Imitation Emerson..........℔ doz $2.00, dis 20&10&10 %
Torrey's..dis 20 %
Badger's Belt and Combination.....................℔ doz $2
Lamont Combination..................................℔ doz $4

Rivets.
Black and Tinned Iron, Flat Head M Rivets (in packages and in bulk)
Block and Carriage (in C packages)
} dis 50 %
Iron Rivets (other than above) in bulk
Black and Tinned Burrs
} dis 45 %
NOTE.—Outside Rivets are sold at concessions from above prices.
Copper Rivets and Burrs...............dis 60&5 @ 60&10 %

Nos.	7	8	9	10	11	12	13	14	15
℔ ℔	49¢	50¢	52¢	54¢	56¢	58¢	60¢	65¢	70¢

Rivet Sets..dis 50&2 %

Rods.
Stair, Brass...dis 25&5 %
Stair, Black Walnut.................................℔ doz 50¢

Rollers.
Barn Door, Sargent's list.....................dis 60&10&10 %
Acme (Anti-Friction)..................................dis 55 %
Union Barn Door Roller.............................dis 70 %

Rope.
Mnf'rs list, November 11, 1885.
Manila.....................⅝ inch and larger ℔ ℔ 13 ¢
Manila....................................½ inch ℔ ℔ 13½¢
Manila........................¼ and 5-16 inch ℔ ℔ 14 ¢
Manila Tarred Rope................................℔ ℔ 12½¢
Manila Hay Rope.....................................℔ ℔ 13 ¢
Sisal..........................⅝ inch and larger ℔ ℔ 9 ¢
Sisal...½ inch ℔ ℔ 9½¢
Sisal...........................¼ and 5-16 inch ℔ ℔ 10 ¢
Sisal, Hay Rope......................................℔ ℔ 9 ¢
Sisal, Tarred Rope...................................℔ ℔ 8½¢
Sisal, Single Ply Lath Yarn........................℔ ℔ 8 ¢
} Dis 1¢ ℔ ℔.
Cotton Rope.................................℔ ℔ 15 @ 18¢ net
Jute Rope..℔ ℔ 7¢

Rules.
Boxwood.................................dis 80&5 @ 80&10 %
Ivory.......................................dis 55 @ 55&10 %
Stephens' Ivory..dis 50 %

Sad Irons.
From 4 to 10, at factory........℔ 100 ℔ $2.25 @ $2.50
Self-Heating...................................℔ doz. $9.00 net
Self-Heating, Tailors'.......................℔ doz. $18.00 net
Gleason's Shield and Toilet.............................dis 25 %
Mrs. Pott's Irons, Double Pointed..............dis 35 @ 40 %
Mrs. Pott's Irons, Square Back.................dis 35 @ 40 %
Enterprise Star Irons, new list, July 20, 1882....dis 35 %
Combined Fluter and Sad Iron....℔ doz. $15.00, dis 15 %
Fox Reversible, Self-Heater.......................℔ doz., $24.00
Chinese Laundry (N. E. Butt Co.)...............8¼¢, dis 15 %
New England..5¢, dis 15 %

Sand Paper and Emery Paper.
Baeder & Adamson's Flint, 00 to 1½..$4.50 ℔ ream
Baeder & Adamson's Flint, 2, 2½ & 3...5.00 ℔ ream
Baeder & Adamson's Flint, assorted...4.75 ℔ ream
Baeder & Adamson's Star..................3.75 ℔ ream
} dis 40@40&5
Bloodgood's Flint, Nos. 00 to 1½.......℔ ream $4.50
Bloodgood's Flint, assorted...............℔ ream 4.50
Bloodgood's Flint, Nos. 2 to 3............℔ ream 5.00
Bloodgood's Flint, No. 3½..................℔ ream 5.50
Columbia Flint, all Nos.....................℔ ream 4.00
Madison Mills Flint, all Nos...............℔ ream 3.50
} dis 40@40&5&5
Emery Paper, 00 to 1½, $6.50; 2, $7.50; 2½, $9.50 ....dis 40 @ 40&5 %
Emery Cloth, B. A. & Co., 00 to 1½, $18; 2, $20; 2½, $24.....................................dis 40 @ 40&5 %
Emery or Crocus Cloth, Sibley, 9x12 in., $16.00
Emery or Crocus Cloth, Sibley, 7x9 in., $10.50
} dis 20 %
New England, same list as B. & A. Flint.........dis 40&5 %
Sand Paper without brand........................℔ ream,

Sash Cord.
Common.................................℔ ℔, 12½¢ @ 13¢ net
Patent......................................℔ ℔, 15¢ @ 16¢ net
White Cotton Braided..........................℔ ℔ 32¢ @ 33¢
Common Russia Sash..................................℔ ℔ 14¢
Patent " "..." 18¢
Cable Laid Italian "......................................." 20¢
India Cable Laid ".." 14¢
Silver Lake, A Quality, White..........50¢, dis 10&10 %
Silver Lake, A Quality, Drab............55¢, dis 10&10 %
Silver Lake, B Quality, White..50¢, dis 10&10&10@30 %
Silver Lake, B Quality, Drab...55¢, dis 10&10&10@30 %
Silver Lake, C Quality, White (only)..........29¢ @ 30¢
Spring Lake, A Quality...........50 @ 55¢, dis 10&10&5 %

Sash Locks.
Clark's No. 1, $10.00; No. 2, $8.00 ℔ gross......dis 33⅓ %
Ferguson's..dis 33⅓ %
Morris..dis 50&10 %
Morris' Triumph (revised list)......................dis 60&10 %
Walker's..dis 10 %
Attwell Mfg. Co.......................................dis 25 @ 33⅓ %
Hammond's Window Springs..............................dis 40 %
Common Sense, Japanned, Coppered and Bronzed..℔ gross
Common Sense, Nickel Plated.......℔ gross $12.00 net
Universal...dis 30 %
Kempshall's Gravity.......................................dis 60 %
Kempshall's Model.................................dis 60@60&10 %
Corbin's Daisy....................................dis 60&5@60&10 %
Payson's Perfect...............................dis 50&10&5 @ 60 %
Hugunin's New and Improved Adjustable Sash Balances, list March, 1885.....................................dis 33⅓ %
Hugunin's New Sash Locks, list March, 1885..dis 33⅓ %
Stoddard "Practical".......................................dis 10 %
Ives Patent..dis 55&10 %

Sash Weights.
Solid Eyes, in ton lots.......................................℔ ton, $20

Sausage Stuffers or Fillers.
Miles' "Challenge"...........℔ doz. $20, dis 45@45&5 %
Perry........℔ doz, No. 1, $15; No. 0, $21, dis 45@45&5 %
Draw Cut No. 4..........................each, $30.00, dis 20 %
Enterprise Mfg. Co..................................dis 20&10 @ 30 %
Silver's..dis 25 %

Saws
Disston's Circular, Mill and Cross Cut........dis 45&10 %
Disston's Hand, Panel, Rip, &c....................dis 20&10 %
Atkins' Silver Steel Circular..........................dis 40 %
Atkins' Selected Steel Circular........................dis 50 %
Atkins' Silver Steel Diamond X Cuts.........℔ foot 75¢
Atkins' Concave Tooth Dexter X Cuts.........℔ foot 55¢
Atkins' Special Steel Diamond X Cuts.........℔ foot 34¢
Atkins' Champion Tooth X Cuts..................℔ foot 32¢
Atkins' Hollow Back X Cuts........................℔ foot 22¢
Atkins' Band...dis 25 %
W., M. & C., Hand...................................dis 30 @ 30&5 %
W. M. & C. Champion X Cuts, Regular........℔ foot 26¢
W. M. & C. X Cuts, Thin Back....................℔ foot 29¢
Peace Circular and Mill................................dis 45&10 %
Peace Hand Panel and Rip......dis 20&10 @ 20&10&5 %
Peace Cross Cuts, Standard..........................℔ foot 25¢
Peace Cross Cuts, Thin Back.........................℔ foot 28¢
Peace Band Saws, all widths........................dis 20&10 %
Richardson's Circular......................................dis 45 %
Richardson's Mill..dis 45 %
Richardson's X-Cuts, No. 1, 30¢; No. 2, 27¢; No. 3, 25¢
Richardson's Hand, Panel, Butcher, &c.......dis 25&5 %
Boynton's Lightning X Cuts.................................℔ ft 32¢
Boynton's Lightning One Man X Cuts..℔ ft 38¢ @ 40¢
Boynton's Lightning Buck Saws...................℔ doz $6.00

Saws, Hack.—See Hack Saws.

Saw Frames.
White, Vermont.......................℔ doz $1.50, dis 25&10 %
Red, Polished and Varnished......℔ doz $1.50, dis 10 %
Saw Rods..$10 list dis 10&10 %

Saw Sets.
Stillman's Genuine....℔ doz $5.00 and $7.75, dis 40&5 %
Stillman's Imitation..℔ doz $3.25 and $5.25, dis 40&5 %
Common Lever.............................℔ doz $2.00, dis 40&5 %
Leach's.......................No. 0, $8.00; No. 1, $15.00, dis 15 %
Nash's.....................................dis 20&10 @ 20&10&5 %
Hammer, Hotchkiss.......................................$5.50, dis 10 %
Hammer, Bemis & Call Co.'s new Patent ...dis 30&5 %
Bemis & Call Co.'s Lever and Spring Hammer.dis 30&5 %
Bemis & Call Co.'s Plate.......................................dis 10 %
Bemis & Call Co.'s Cross Cut..................................dis 12½ %
Aiken's Genuine..................................$13.00, dis 50&10 %
Aiken's Imitation....................................$7.00, dis 55&5 %
Hart's Patent Lever...dis 20 %
Disston's, Star, $9, No. 15 Hammer, $5.50...dis 20&10 %
Atkins' Adjustable....................................per doz $6.00
Atkins' Criterion.......................................per doz $7.00
Morrill's No. 1, $15.00; Nos. 3 and 4, $24.dis 40&10@50 %
Croissant (Keller) No. 1, $15.00; No. 2, $24.00, dis 33⅓&10 %
Boynton's No. 1, $12 ℔ doz; No. 2, $10..................dis 25 %

Saw Tools.
Atkins' Patent.......................................per doz sets $6.00

Scales.
Hatch, Counter, No. 171.......℔ doz $42.00, dis 50&10 %
Hatch, Tea, No. 161.............℔ doz $15.00, dis 50&10 %
Union Platform, Plain.......................................$2.15 @ 2.20
Union Platform, Striped....................................$2.30 @ 2.40
Chatillon's Grocers..dis 40 %
Chatillon's Eureka...dis 25 %
Chatillon's Family Favorite.................................dis 30 %
Family Universal, ℔ doz, 12 ℔, $30.00; 24 ℔, $36.00, net
Family, Turnbull's...................................dis 30@30&10 %

Scale Beams.
Scale Beams, List of Jan. 12, 1882..dis 60&5 @ 60&10 %
Scale Beams, Custer..dis 25 %

Scrapers.
Adjustable Box Scraper (S. R. & L. Co.).$6.50, dis 20&10 %
Box, 1 Handle.............................℔ doz $4.00, dis 10 %
Box, 2 Handle.............................℔ doz $6.00, dis 10 %
Defiance Box and Ship..dis 20&10 %
Foot..dis 50&10 %
Ship, Common...℔ doz $3.50 net
Ship, Providence Tool Co...dis 10 %

Screen Corners.
Porter's Pat. Window and Door Frame..........dis 33⅓ %
Screen Corner Irons, Warner's...........................dis 33⅓ %

Screw Drivers.
Douglas Mfg Co...dis 20&10&10 %
Disston's...dis 45&10 %
Disston's Patent Excelsior.................................dis 45&10 %
Buck Bros...dis 30 %
Stanley R. & L. Co.'s Varnished Handles....dis 60&10 %
Stanley R. & L. Co.'s Black Handles..........dis 50&10 %
Sargent & Co.'s Nos. 1 & 20 Forged Blade..dis 70&10 %
Sargent & Co.'s Nos. 40 & 30, Cast Steel.dis 55&10&10 %
Sargent & Co.'s No. 60, Round Blade....dis 60&10&10 %
Knapp & Cowles' No. 1..dis 70 %
Knapp & Cowles' No. 1 Extra...............................dis 60&10 %
Knapp & Cowles' No. 00 & 4.........dis 50&5@50&10&5 %
Sets interchangeable.......................℔ doz $18.00, dis 25 %
Champion..dis 25 %
Clark's Patent...dis 20&10 %
Crawford's Adjustable..dis 30 %
Knapp & Cowles' Screw-Driver Bitts...............℔ doz 90¢
Eilrich's Socket and Ratchet......................................dis 25 %
Allard's Spiral, new list..dis 25 %

Screws.
Wood Screws—
Am. Screw Co.'s list, Jan. 1, 1885:
Flat Head Iron..dis 80 %
Round Head Iron...dis 75&10 %
NOTE.—On above Screws an extra discount of 10 % ¼ inch and smaller is given.
Flat Head Brass..dis 75&10 %
Round Head Brass...dis 75 %
Russell & Erwin list April 1, 1885:
Flat Head Iron...dis 85 %
Round Head Iron..dis 83⅓ %
Flat Head Brass..dis 85 %
Round Head Brass..dis 83⅓ %
Brass and Silver Capped Screws..................................dis 40 %
Machine—
Flat Head, Iron...dis 60 %
Round Head, Iron...dis 55 %
Bench and Hand—
Bench, Iron...............................dis 55&10 @ 55&10&10 %
Bench, Wood, Beech...℔ doz $2.25
Bench, Wood, Hickory.......................................dis 20&10 %
Hand, Wood....................................dis 25&10 @ 25&10&5 %
Lag or Coach'...dis 75&10 @ 80 %
Coach, Patent Gimlet Point............................dis 75 @ 75&5 %
Bed...dis 25&5 %
Hand Rail, Sargent's..dis 66⅔&10 %
Hand Rail, Humason, Beckley & Co.'s.......................dis 70 %
Hand Rail, Am. Screw Co...dis 70 %

Scroll Saws.
Lester, complete, $10.00..dis 25 %
Rogers, complete, $4.00...dis 25 %

Scythe Snaths...dis 40&5&2 %

Shears.
American (Cast) Iron........................dis 75&10 @ 75&10&5 %
Pruning...........................See Pruning Hooks and Shears
Barnard's Lamp Trimmers...................................℔ doz $3.75
Tinners'...dis 20&2 %
Seymour's, List, Dec., 1881................................dis 60&10&5 %
Heinsch's, List, Dec., 1881..................................dis 60&10 %
Heinsch's Tailor's Shears......................................dis 33⅓ %

First quality C. S. Trimmers..................................dis 80 %
Second quality C. S. Trimmers.dis 80&10 @ 80&10&5 %
Acme Cast Shears..dis 10&10 %
Diamond Cast Shears...dis 10 %
Clipper..dis 10&10 %
Victor Cast Shears...dis 75&10 %
Howe Bros. & Hulbert, Solid Forged Steel.......dis 40 %

Sheaves.
Sliding Door—
M. W. & Co., list........................dis 66⅔&10&2 @ 70&5 %
R. & E., list...dis 60&10&2 %
Corbin's list...dis 60&10&2 %
Patent Roller..dis 60&10&2 %
Patent Roller, Hatfield's..dis 70 %
Russell's Anti-Friction..dis 60&10&2 %
Moore's Anti-Friction...dis 60 %
Sliding Shutter—
R. & E. list..dis 60&10&2 %
Sargent's list...dis 66⅔&10 %
Reading list...dis 66⅔&10 %

Ship Tools.
L. & I. J. White...dis 20&5 %
Albertson Mfg. Co...dis 25 %

Shovels and Spades.
Ames' Shovels, Spades, &c., Ames' brands......dis 20 %
Some special brands of Ames' goods.........dis 20&10 %
Griffith's Black Iron...dis 50&10 %
Griffith's Steel..dis 60 %
Griffith's Solid Cast Steel R. R. Goods..................dis 20 %
Old Colony..dis 15 %
Groom Shovel Co...dis 20 @ 20&5 %
Hussey, Binns & Co.......................................dis 20 @ 20&5 %
Lehigh Mfg. Co...dis 50&10 %
Payne Pettebone & Son, list Jan. 2, 1882.....dis 50&5 %
R. T. Pettebone, Pat. Shovels, new list...............dis 50 %
R. T. Pettebone, Pat. Scoops, new list..................dis 20 %
Remington's (Lowman's Patent).............dis 30 @ 30&10 %
Rowland's, Black Iron.......................................dis 50&10 %
Rowland's Steel..................................dis 60&5 @ 60&10 %

Shovels and Tongs.
Iron and Brass Head..................dis 60&10&5@60&10&10 %

Sieves.
Buffalo Metallic, S. S. & Co., new list..........dis 50&20 %
Barter's Flour Sifters.....................................℔ doz $2 50
Sieves, Wooden Rim—

	Iron.	Plated.
Mesh 18, Nested, ℔ doz.	65¢	83¢
Mesh 20, Nested, ℔ doz.	80¢	95¢
Mesh 24, Nested, ℔ doz.	95¢	$1.05

Slates.
School, by case.......................................dis 45 @ 50 %

Soldering Irons.
Covert's Adjustable...dis 60&20 %

Spoke Shaves.
Iron...dis 45 %
Wood...dis 30 %
Bailey's (Stanley R. & L. Co.)...........................dis 40&10 %
Stearns'..dis 30&10 %

Spoke Trimmers.
Bonney's.....................................℔ doz $10.00, dis 50 %
Stearns'.......................................℔ doz $9.00, dis 20&10 %
Ives'......No. 1, $15.00; No. 2, $12.00 ℔ doz, dis 55&10 %
Douglass'.....................................℔ doz $9.00, dis 20 %

Spoons and Forks.
Tinned Iron—
Basting, Central Stamping Co.'s list......dis 33⅓&2 %
Solid Table and Tea, Central Stamping Company's list...dis 33⅓&2 %
Buffalo, S. S. & Co...dis 50&10 %
Silver-Plated—
Meriden Brit. Co., Rogers..................................dis 50&5 %
Reed & Barton...dis 50&5 %
Wm. Rogers Mfg. Co...dis 50&10 %
Holmes, Booth & Haydens..........................dis 50&10@60 %
Holmes & Edwards Silver Co......................dis 50&10@60 %
Cast Steel, Silver Plated......................................dis 40 %
H. & E. Silver Co. Steel Silver-Plated Teas, $15; Tables, $30.............................dis 50 @ 50&10 %
German Silver..dis 50 %
Britannia...dis 60&10 %

Springs.
Elliptic, Concord, Platform and Half Scroll...... dis 60&10&10 %

Squares.
Steel and Iron
Nickel-Plated
} dis 70&5 @ 70&10 %
Try Square and T Bevels.....................................dis 60&10 %
Winton's Try Square and T Bevels........................dis 45&10 %
Disstertottom's Try and Miter..............................dis 20&10 %

Staples.
Fence Staples, Galvanized................................℔ ℔, 4½¢
Fence Staples, Plain..℔ ℔, 3½¢

Steelyards...dis 40&10@50&5 %

Stocks and Dies.
Blacksmith's..dis 15&10@25 %
"Lightning" Screw Plate..............................dis 10 @ 15&10 %

Stone.
Hindostan No. 1, 3¼¢; Axe, 4¼¢; Slips, 5½¢.....
Sand Stone..℔ ℔, 2¼¢
Washita Stone, Extra...℔ ℔, 17@18¢
Washita Stone, No. 1.....................................℔ ℔, 14¢ @ 14½¢
Washita Stone, No. 2.....................................℔ ℔, 11¼¢ @ 11½¢
Washita Stone Slips, No. 1...................................℔ ℔, 28¢ @ 29¢
Arkansas Stone, No. 1, 4 to 6 in..........................℔ ℔, $1.45@1.50
Arkansas Stone, No. 1, 6 to 9 in..................................℔ ℔, $1.75
Turkey Oil Stone..4 to 8 in., ℔ ℔, 60¢
Turkey Slips...℔ ℔, $2.00
Lake Superior...℔ ℔, 17¢
Lake Superior Slips...℔ ℔, 31@32¢

Stove Boards.
Buffalo Zinc, S. S. & Co......................................dis 50 %

Stove Polish.
Joseph Dixon's..℔ gro $6.00, dis 10 %
Gem...℔ gro $4.50, dis 10 %
Gold Medal...℔ gro $6.00, dis 25 %
"Mirror"...℔ gro $6.00, dis — %
Lustro...℔ gro $4.75 net
Ruby..℔ gro $3.75 net
Rising Sun...℔ gro $5.75 net
Dixon's Plumbago...℔ ℔ 8¢ net
Boynton's Noon Day, ℔ gro..$5.00

Tacks, Brads, &c.
List, Sept. 1, 1882
American Iron Carpet Tacks, all kinds.dis 60 %
Steel Carpet Tacks, all kinds...............dis 55 %
Swedes Iron Carpet Tacks, all kinds....dis 55 %
Swedes Iron Tacks.............................dis 55 %
Swedes Iron Upholsterers' Tacks..........dis 55 %
Tinned Swedes Iron Tacks....................dis 55 %
Tin'd Swedes Iron Upholsterers' Tacks.dis 55 %
American Iron Cut Tacks......................dis 55 %
Copper Tacks....................................dis 50 %
Copper Finishing and Trunk Nails........dis 50 %
Cigar Box Nails..................................dis 45 %
Finishing Nails...................................dis 45 %
Hungarian Nails and Miners' Tacks.....dis 40 %
Gimp and Lace Tacks..........................dis 50 %
Tinned Gimp and Lace Tacks................dis 50 %
Trunk and Clout Nails.........................dis 37½ %
Tinned Trunk and Clout Nails..............dis 37½ %
Basket Nails......................................dis 37½ %
Chair Nails..dis 37½ %
Common and Patent Brads..................dis 45 %
Tinned Capped Trunk Nails................dis 30 %
Looking-Glass Tacks...........................dis 25 %
Picture-Frame Points..........................dis 25 %
Leathered Carpet Tacks......................dis 25 %
Brush Tacks......................................dis 25 %
Shoe Finders'.......................List Nov. 18, 1885
Lining and Saddle Nails.........List June 19, 1885
} Combination goods, extra, 10&2 %. Outside goods (except Lining and Saddle Nails), extra 10&2 @ 10&10&2 %.
Double-pointed Tacks.................................dis 80 %
Wire Carpet Nails..dis 50 %
Wire Carpet Nails, R. & E. Mfg. Co...........dis 40&10 %
Steel Wire Brads, R. & E. Mfg. Co............dis 40&10 %

Tap Borers.
Common and Ring...dis 20&10 %
Ives' Tap Borers......................Nos. 1, 2, 4—dis 15&10 %
Ives' Tap Borers......................Nos. 13, 14—dis 25&10 %
Enterprise Mfg. Co..dis 20&10 %
Clark's...dis 33⅓ @ 35 %

Tapes, Measuring.
American...dis 25&10 %
Spring..dis 40 %
Chesterman's.....................Regular list dis 25 @ 30 %

Thermometers.
Tin Case.....................................dis 80 @ 80&10 %

Tinners' Shears, &c.
Shears and Snips (P. S. & W.)....................dis 20 @ 25 %
Punches—See Punches.
Snips, J. Mallinson & Co...........................dis 33⅓ %

Tinware.
Stamped, Japanned and Pieced, Central Stamping Co........dis 30&2 @ — %
Pieced, S. S. & Co.....................dis 60 %
Japanned, S. S. & Co...............dis 25&10 %
Stamped, S. S. & Co.........dis 30&2 @ — %
} Extras sometimes given.

Tobacco Cutters.
Enterprise Mfg. Co. (Champion)........dis 20&10 @ 30 %
Wood Bottom..............................℔ doz $5.00 @ $5.25
All Iron...℔ doz $4.25
Nashua Lock Co.'s..............℔ doz $18.00, dis 50 @ 55 %
Wilson's..dis 55 %
Clipper (Sargent & Co.)......℔ doz $24, dis 50&10&10 %
Acme..................................℔ doz $20.00, dis 40 %

Transom Lifters
Wollensak's Patent Iron Bronzed.....................dis 50 %
Reiher's Improved Self-Locking (Class 301).....dis 40 %
Reiher's Improved Set Screw (Class 201).........dis 45 %
Reiher's (Class 101)....................................dis 50&10 %
Excelsior...dis 50&10&2 %
Shaw's...dis 45&10 %

Traps.
Game—
Newhouse...dis 35 %
Oneida Pattern......................................dis 60&10&10 %
Game, Blake's Patent..............................dis 40&10&5 %
Mouse and Rat—
Mouse, Wood, Choker..........................℔ doz holes, 15¢
Mouse, Round Wire..........................℔ doz $1.50, dis 10 %
Mouse, Cage, Wire...........................℔ doz $2.50, dis 10 %
Mouse, Catch-'em-alive....................℔ doz $2.50, dis 15 %
Mouse, "Bonanza"..................................℔ gross $10 net
Mouse, Delusion.....................℔ gross $18.00, dis 15 %
Rat, "Decoy"..........................℔ gross $10.00, dis 10
Ideal...℔ gross $10
Cyclone..℔ gross $5.25

Trowels.
Lothrops' Brick and Plastering.......................dis 20&10
Reed's Brick and Plastering...............................dis 15 %
Disston's Brick and Plastering.........................dis 20&10 %
Peace's Plastering...dis 25 %
Clement & Maynard's.......................................dis 20 %
Rose's Brick...dis 15 %
Brade's Brick..dis 25 %
Worrall's Brick and Plastering...........................dis 20 %
Garden..dis 70 %

Triers.
Butter and Cheese...dis 25 %

Trucks, Warehouse, &c.
Penfield Block Co.'s list, 1882..............................dis 40

Twine.

			BC.	b.	
No. 9, Flax Twine,	¼ and ½ ℔ Balls		24¢	31¢	..
No. 12, " "	¼ and ½	"	22¢	24¢	...
No. 18, " "	¼ and ½	"	20¢	22¢	..
No. 24, " "	¼ and ½	"	20¢	22¢	..
No. 36, " "	¼ and ½	"	19¢	21¢	....
No. 264, Mattrass,	¼ and ½	"			50

Chalk Line, Cotton, ½ ℔ Balls.......................................28
Mason Line, Linen, ½..60
2-Ply Hemp, ¼ and ½ ℔ Balls (Spring Twine)......14½
3-Ply Hemp, 1 ℔ Balls...15¢
3-Ply Hemp, 1½ ℔ Balls..13
Cotton Wrapping, 5 Balls to ℔......................14¢ @ 20
2, 3, 4 and 5 Ply Jute, ½ ℔ Balls...................................11
Wool..6¢ @ 6½¢
Paper..13¢ @ 14¢
Cotton Mops—6, 9, 12 and 15 ℔ to doz.........................17

Vises.
Solid Box..dis 50&10 @ 60
Parallel—
Fisher & Norris Double Screw.......................dis 15&10 %
Stephens'...dis 25 %
Parker's...dis 20 @ 25 %
Wilson's...dis 55 %
Howard's..dis 40 %
Bonney's..dis 40 %
Trenton...................................dis 40&5 @ 40&10 %
Merrill's...dis 15@20 %
Sargent's..dis 66⅔&10 %
Backus and Union...dis 40 %
Double Screw Lee.....................................dis 15&10 %
Prentiss...dis 20@25 %
Simpson's Adjustable.......................................dis 40 %
Saw Filers—
Bonney's, Nos. 2 & 3......................℔ doz $15.00, dis 40 %
Stearn's..dis 40 %
Hopkins'..................................℔ doz $17.50, dis 10 %
Reading...dis 40&10 %
Wentworth..dis 20&10 %
Cowell Hand Vises...dis 20 %
Bauer's Pipe Vises..dis 10 %

Washer Cutters.
Smith's Patent.............℔ doz $12.00, dis 20&10&10 %
Johnson's....................................℔ doz $11.00, dis 33⅓ %
Penny's.....................℔ doz Pol. $14; Jap'd, $16..dis 55 %
Appleton's.................................℔ doz $16.00, dis 60&10 %
Bonney's..dis 30&10

Washers.—See Nuts and Washers.

Well Buckets, Galvanized.
Hill's......................℔ doz ..12 qt., $3.50; 14 qt., $4.50
Iron Clad...............................℔ doz., 14 qt., $8—dis
Whiting's Flat Iron Band...................................℔ doz $4.25
Whiting's Wired Top.......................................℔ doz $4.00

Well Wheels—8 in., $1.85; 10 in., $2.15; 12 in., $2.90

Wire.
Brass and Copper, new list, Jan. 18, '84.dis 33⅓@30&10 %
Iron—
Market, Bright and Annealed, Nos. 0 to 18.....dis 70 %
Market, Coppered, Nos. 0 to 18......................dis 65&5 %
Market, Galvanized, Nos. 0 to 18....................dis 60&5 %
Market, Tinned, Tinned list, Nos. 0 to 18...dis 60&5 %
Stone Bright and Annealed, Nos. 16 to 18..........dis 65 %
Stone, Bright and Annealed, Nos. 19 to 26...dis 65&5 %
Stone, Bright and Annealed, Nos. 27 to 36..dis 70&5 %
Stone, Galvanized, Nos. 19 to 30.........................dis 55 %
Stone, Tinned, Tinned list, Nos. 18 to 36...dis 60&5 %
Tinned Broom Wire, Nos. 18 to 24......................dis 65 %
Annealed Fence, Nos. 8 & 9..............................dis 70 %
Annealed Grape, Nos. 10 to 14..........................dis 70 %
Barb Fence......................................See Trade Report
Wire on Spools..dis 65 %
Malin's Spld Wire, 1 ℔, ½ ℔ & ¼ ℔ sp'ls, dis 50&10&5 %
Cast Steel Wire..dis 50@50&5 %
Stubs' Steel Wire....................................$6.00 to £, dis 30 %
Steel Music Wire, Nos. 12 to 30....................................55¢ ℔ ℔
Picture Wire...dis 60&10 %
Barb Wire Safety Guards....................℔ 1000 $9.00, dis 25 %
Wire Clothes Lines. See Lines.

Wire Cloth.
Green, drab and black, ℔ 100 sq. ft...................$1.85@2.00

Wrenches.—American Adjustable.....................dis 45 %
Baxter's Adjustable "S"..dis 33⅓ %
Baxter's Diagonal...dis 35&10 %
Coes' Genuine................................cash in 10 days, dis 60&3 %
Coes' "Mechanics'"..dis 60&10&3 %
Coes' Pattern, Malleable.......................................dis 80&5 %
Coes' Pattern, Wrought............................dis 75&10&5 @ 80 %
Girard Standard.................................dis 70&10 @ 70&10&5 %
Girard Agricultural..dis 80 %
Sterling Wrench, Wrought............................dis 75&10&5 @ 80 %
Sterling Wrench, Malleable.................................dis 80 @ 80&5 %
Bemis & Call's Patent Combination..........................dis 30&5 %
Bemis & Call's Merrick's Pattern...................................dis 35 %
Bemis & Call's Brigg's Pattern.......................................dis 25 %
Bemis & Call's Cylinder or Gas Pipe..........................dis 40&5 %
Bemis & Call's No. 3 Pipe.......................................dis 35&5 %
Aiken's Pocket (Bright)....................................$6.00, dis 50&10 %
The Favorite Pocket (Bright).................℔ doz $4.00, dis 40 %
Webster's Patent Combination.....................................dis 25 %
Boardman's..dis 25@25&10 %
Always Ready..dis 25&5 %
Alligator...dis 40&10 %
Donohue's Engineer...dis 25 %
Acme, Bright..dis 60&3 %
Acme, Nickeled..dis 45 %
Acme, Bicycle, 4½ in...dis 45 %

Wringers. Per doz.
Adams & Co. No. 8...$30.00
Advance..30.00
Excelsior, for Stationary Tubs, No. E, 10-inch 39.00
Excelsior, for Stationary Tubs, No. F, 11-inch 43.50
Excelsior, with Folding Bench, No. A, 10-inch 48.00
Excelsior, with Folding Bench, No. B, 11-inch 52.50
Leader...28.00
"Metropolitan," No. 2...33.00
"Metropolitan," No. 2½..30.00
Novelty, for Common Tubs, No. 2, 10-inch....30.00
Novelty, for Common Tubs, No. 3, 11-inch....34.50
No. 99 Improved 2½..30.00
Peerless No. 2½..30.00
Peerless No. 3½..34.50
Universal, No. 2½..30.00
Universal, No. 2..33.00
Universal, No. 1¼..34.50
Universal, No. 1½..39.00
Universal, No. 1..57.00
Universal, for Set Tubs, A 2½...39.00
Universal, for Set Tubs, E 1½...48.00
Universal, for Set Tubs, C 1..66.00
} dis $3 ℔ doz.
Eureka...℔ doz $20, net

Wrought Goods.
Staples, Hooks, &c.......................dis 80&10 @ 80&15 %

WHOLESALE METAL PRICES, November 18, 1885.

METALS.

IRON.—DUTY: Bars, 8-10¢ to 1 1-10¢ ℔ lb; provided that no Bar Iron shall pay a less rate of duty than 35 %. Sheet, 1 1-0¢ to 1 5-10¢ ℔ lb. Band, Hoop and Scroll, 1¢ to 1 4-10¢ ℔ lb. Railroad Bars weighing more than 25 lb ℔ yard, 7-10¢ of 1¢ ℔ lb.

Standard American Pig Iron.

Foundry No. 1 X	℔ ton	$17.50 @ 18.50
Foundry No. 2 X	℔ ton	16.00 @ 16.50
Gray Forge	℔ ton	15.00 @ 15.50

No. 1 Scotch Pig Iron.

Carnbroe	℔ ton	18.50 @ 19.00
Coltness	℔ ton	19.50 @ 20.00
Shotts	℔ ton	19.50 @ 20.00
Glengarnock	℔ ton	18.50 @ 19.00
Gartsherrie	℔ ton	19 50 @ ....
Langloan	℔ ton	20.00 @ ....
Summerlee	℔ ton	19.00 @ 19.50
Dalmellington	℔ ton	18.50 @ ....
Eglinton	℔ ton	17.50 @ 18.00
Clyde	℔ ton	18 50 @ 19.00

Rails.

Steel, at Eastern mills	℔ ton	$34.00 @ 35.00
Old Rails, Ts	℔ ton	$18.25 @ 18.50

Scrap.

Wrought, ℔ ton, from yard	18.00 @ 18.50

Bar Iron from Store.

Common Iron: ¾ to 1 in. round and square ... 1 to 6 in. x ¾ to 1 in	℔ lb	1.6 @ 1.75¢
Refined Iron: ¾ to 2 in. round and square ... 1 to 6 in. x ¾ to 1 in	℔ lb	1.85 @ 2.3¢
1 to 6 in. x ⅜ and 5-16	℔ lb	1.9 @ 2.4¢
Rods—¾ and 11-16 round and sq	℔ lb	1.7 @ 2.3¢
Bands—1 to 6 x 3-16 to No. 12	℔ lb	2 @ 2.5¢
"Burden's Best" Iron, base price	℔ lb	2.9¢
Burden's "H. B. & S." Iron, base price	℔ lb	2.5¢
Norway Nail Rods		5 @ 6¢

Sheet Iron from Store.

	Common American.	R. G. Cleaned.
Nos. 10 to 16	℔ lb 2.70 @ 3 ¢	3¼¢
17 to 20	℔ lb 3 @	3½¢
21 to 24	℔ lb 3 @	3½¢
25 and 26	℔ lb 3.12½ @	3¾¢
27	℔ lb 3.25 @	3¾¢
28	℔ lb 3.37½ @ 3.50	4 ¢

	B B.	2d qual.
Galvanized, 10 to 20	℔ lb 5 ¢	4¾¢
Galvanized, 21 to 24	℔ lb 5¼¢	5 ¢
Galvanized, 25 to 26	℔ lb 6 ¢	5¼¢
Galvanized, 27	℔ lb 6¼¢	6 ¢
Galvanized, 28	℔ lb 7 ¢	6¼¢
American Russia	℔ lb A, 10¢	B, 9¢
Russia	℔ lb 10½¢ @ 11 ¢	
American Cold Rolled B. B.	℔ lb 5 ¢ @ 7 ¢	

Iron Wire.—(*See Wire.*)

STEEL.—DUTY. Ingots, Bars, Sheets, &c., valued at 4¢ ℔ lb or less, 45 % ad. val.; valued above 4¢ and not above 7¢ ℔ lb, 2¢ ℔ lb; valued above 7¢ and not above 10¢ ℔ lb, 2¾¢ ℔ lb; valued above 10¢ ℔ lb, 3½¢ ℔ lb. *Extras.*—Steel Bars, Rods, &c., cold hammered or polished, in any way in addition to ordinary hot rolling, 1¼¢ ℔ lb in addition to above; Steel Circular Saw Plates, 1¢ ℔ lb in addition to the above.

American Cast Steel.

For American Steel, see Pittsburgh quotations.

Chrome Steel.

Too. Steel, ordinary sizes, ⅜ to 3 inches, net	10 @ 14¢
Adamantine Shoes and Dies	8 @ ..¢
Magnet Steel	14 @ ..¢

English Steel.

Best Cast	℔ lb	15½¢
Extra Cast	℔ lb	16½ @ 17½¢
Circular Saw Plates	℔ lb	14½¢
Round Machinery, Cast	℔ lb	10½¢
Swaged, Cast	℔ lb	16½¢
Best Double Shear	℔ lb	15½¢
Blister, 1st quality	℔ lb	14 ¢
German Steel, Best	℔ lb	10 ¢
2d quality	℔ lb	9 ¢
3d quality	℔ lb	8 ¢
Sheet Cast Steel, 1st quality	℔ lb	15½¢
2d quality	℔ lb	14½¢
3d quality	℔ lb	12½¢

TIN.—DUTY Plates, Sheets, Tagger and Terne, 1¢ ℔ lb; Bars, Block and Pigs free.

Banca	℔ lb	.... @ 22 ¢
Straits	℔ lb	21 ¢ @ 22 ¢
English	℔ lb	21½¢ @ 21⅞¢
Bar	℔ lb	20½¢ @ ....

Charcoal Tin Plates.

I C 10x14 225 sheets	℔ box	$5.25 @	7.25
I C 12x12 225 sheets	"	5.25 @	7.50
I C 20x28, 112 "	"	10.50 @	14.50
I X 10x14 225 sheets	"	6.25 @	9.25
I X 12x12 225 sheets	"	6.25 @	9.50
I X 14x20, 112 "	"	6.25 @	9.25
D C 12½x17 100 "	"	5.00 @	5.50
D X 12½x17, 100 "	"	6.25 @	7.00
For each additional X add	"	1.25 @	2 00

Coke Tin Plates.

	Best.	Ordinary
I C 10x14	$4.75	$4.65 @ ....
I C 14x20		
I C 12x12	4.87½	4.75 @ ....
I C 10x30, gutters, 225 sheets	6.00	7.25
I C 20x28, 112 sheets		10.25

Terne Plates.

	Prime Char.	2d. quality	Coke.
I C 14x20 M. F.	$7	....	....
I C 14x20 Old Process	....	....	$6.87½
I C 20x28 "	....	....	14.25
I C 14x20	$4.75 @ 4.87½		
I X 14x20	6.25 @ 6.75		
I C 20x28	9.25 @ 9.75	8.75	8.62½ @ 8.75
I X 20x28	12.75 @ 14.50		
I C 20x200	18.50 @		

Tin Boiler Plates.

I XX 14x28, 2 sheets for No. 7, 112 sheets	@	$12.00
I XX 14x28, 2 " " No. 8, "	@	13.00
I XX 14x31, 2 " " No. 9, "	@	15.00

COPPER.—DUTY: Pig, Bar and Ingot, 4¢: Old Copper, 3¢ ℔ lb. Manufactured (including all articles of which Copper is a component of chief value), 35 % ad valorem.

Ingot, Lake	℔ lb	11¼¢ @ 11¾¢
Ingot, Baltimore	"	10¾¢ @ 11 ¢
Ingot Anchor	"	10¾¢ @ 11 ¢
Braziers' Copper, ordinary sizes, 16 oz. ℔ sq. ft. and over	....	@ 16 ¢
Braziers' Copper, ordinary sizes, under 16 oz. and over 12 oz. ℔ sq. ft.	"	@ 18 ¢
Braziers' Copper, 10 oz. and 12 oz. ℔ sq. ft.	"	@ 20 ¢
Lighter than 10 oz. ℔ sq. ft.	....	@ 22 ¢
Circles less than 84 in. in diam	"	@ 20 ¢
" 84 in. diam. and over	"	@ 23 ¢
Segment and Pattern Sheets	"	@ 20 ¢
Locomotive Fire-Box Sheets	"	@ 19 ¢
Sheathing Copper, over 12 oz. ℔ sq. ft.	" 14¾	@ 15 ¢
Bolt Copper	"	@ 18 ¢
Copper Bottoms	" 16¾	@ 17½¢
Nickel-Plated Sheathing	"	@ 35 ¢
" " for boilers	"	@ 37 ¢
Plating extra	" 25 ¢	@ 37 ¢
Flat Copper Boiler Bottoms or Pit Bottoms, cut to special sizes	"	@ 21 ¢

Tinning.

14x48, by the case	℔ sheet, 8¢
14x48, less than case	" 8¢

For tinning both sides, double the above amount.

O'Neill's Patent Planished Copper.—Net.

14x48

14 and 16 oz. and heavier.30¢ By the case.℔ lb 29¢
12 oz. and lighter.....32¢ " " " 32¢

Boiler Sizes.

7 in., 14x52. 8 in., 14x56. 9 in., 14x60.
14 and 16 oz. and heavier.32¢ By the case.℔ lb 31¢
(And all sizes not over 20 in. wide.)

24x48 and 30x60.

14 and 16 oz. and heavier.....℔ lb 34¢
2 oz " " 37¢

Copper Wire.—(*See Wire.*)

Sheathing Metal.

Yellow Sheathing Metal, ℔ lb	30¢ @ ....

BRASS AND GERMAN SILVER.

Brown & Sharpe's Gauge the Standard for Metal; Old English Gauge the Standard for Wire.

Brass Manufacturers' Price List, January 17, 1884. dis. 30 @ 30 %

LEAD.—DUTY: Pig, $2 ℔ 100 lb; Old Lead, 2¢ ℔ lb; Pipe and Sheet, 3¢ ℔ lb.

American	4 1-5 @ 4⅝¢
Bar	4½ @ ¢
Pipe	6¢, dis 30 %
Block Tin Pipe	40¢
Tin Lined Pipe	15¢, dis 20 %
Sheet	7¢, dis 20 %
Shot, ℔ bag	Drop, $1.50; Buck, $1.75
Chilled Shot, ℔ bag	$1.75

ANTIMONY.

Hallett's	℔ lb	9 @ 9½¢
Cookson	"	9½ @ 10½¢

SPELTER.—Duty: Pigs, Bars and Plates, $1.50 ℔ 100 lbs.

American, cash	4⅝ ¢ @ 5¢
Bergenport	9¢

ZINC.—Duty: Pig or Block, $1.50 ℔ 100 lbs. Sheet, 2½¢ ℔ lb.

600 lb casks	5.80 @ 6.00¢
Zinc.—Open	6.50 @ 7¢
Zinc Tubing	dis. 10 @ 20 %

Zinc Tubing.—Dis. 25 %.

Plain	.27
Fancy	.33
Scotch and Extra Patterns	.36

BABBITT METAL.

N. P. U	℔ lb	6½ @ 7¢
X		.10¢
X X		.15¢
J. B		.30¢

WIRE.

Market Wire.—Put up in 63 lb bundles.

Nos. 00 to 9,	10, 11,	12,	13, 14,	15, 16,	17,	18.
10	11	11½	12½	14	15	16

Bright Market Wire	dis 70 %
" Charcoal	dis 50 %
" Bale Wire, Nos. 7 to 12	dis 65 %
Annealed Market Wire. " Fence Wire, Nos. 8 and 9. " Grape Wire, Nos. 10 to 14	dis 70 %
Coppered Market Wire	dis. 65 %
" Bale Wire, Nos. 7 to 12	dis. 60 %
Galvanized Market Wire. " Fence Wire	dis 60 %

Stone or Weaving Wire.

Nos.	16	17	18	19	20	21	22	23	24	25	26
Cents	14	15	16	19	20	21	22	23	24	25	26
Nos.	27	28	29	30	31	32	33	34	35	36	..
Cents	28	29	30	32	33	35	37	40	45	55	..

Nos. 16 to 18	dis. 70 @	70 %
19 to 26	"	70 %
27 to 36	" 75 @	75 %
Galvanized Stone Wire	"	50 %

Steel Wire.

Cast Steel, Steel Wire list	dis. 50 %

Brass and Copper Wire.

Old English Gauge the Standard.—Dis 20 @ 30.

	Common High Brass	Low Brass	Gilding Bronze and Copper.
All Nos. to No. 16, inclusive	$0.22	$0.26	$0.30
No. 17 and 18	.23	.27	.31
" 19 and 20	.24	.28	.32
" 21	.25	.29	.33
" 22	.26	.30	.34
" 23	.28	.32	.36
" 24	.30	.34	.38
" 25	.32	.36	.40
" 26	.35	.39	.43
" 27	.38	.42	.46
" 28	.42	.46	.51
" 29	.45	.49	.54
" 30	.48	.52	.62
" 31	.51	.55	.67
" 32	.55	.59	.73
" 33	.59	.63	.82
" 34	.64	.68	.95
" 35	.70	.74	1.80
" 36	.76	.80	1.50
" 37	1.00	1.04	1.79
" 38	1.30	1.34	2.00
" 39	2.00	2.00	3.25
" 40	2.60	2.60	5.75

Spring Wire, 2 cents per pound advance Whitened Wire, 3 cents per pound advance. Flat, Square and Half-Round Wire, 4 cents advance on Round Wire. Fancy Wire, not less than 10 cents advance on Round Wire. Spooling on one-pound Spools, 12 cents per pound extra. Spooling on ten-pound Spools or more 2 cents per pound extra.

MISCELLANEOUS TINNERS' STOCK.

Solder.

½ & ½, Warranted	.14¢
Extra	.15¢
No. 1 Refined	10½ @ 11½¢
No. 2 Solder	10½ @ 10¾¢
Extra wiping	10½ @ 11½¢

Rivets.

Iron and Tinned, new list, Dec. 10, 1881	dis. 50 %
In bulk, new list, Dec. 10, 1881	dis. 50 %
Copper Rivets and Burrs	dis. 30&10@60 %

Nos.	7	8	9	10	11	12	13	14	1
℔ lb.	49¢	50¢	52¢	54¢	56¢	58¢	60¢	65¢	70¢

Stove Bolts.

American Screw Co.'s	dis. 65 %
R. B. & W	dis.
R. & E. Mfg. Co	dis. 70 %

FRENCH GLASS.

August 20, 1885. Per Box, 50 feet.

Single Thick.

Sizes.	1st. E F H	2d. I E H	3d. H H	4th. H B
25 6 x 8 to 10 x 15	$11.50	$10.50	$10.00	$9.50
40 11 x 14 to 16 x 24	13.00	12.25	11.50	10.75
50 18 x 22 to 20 x 30	17.00	16.00	14.50	13.25
54 15 x 36 to 24 x 30	19.00	17.00	15.00	
60 26 x 28 to 24 x 36	20.00	18.50	16.25	
70 26 x 36 to 26 x 44	21.50	20.00	16.50	
80 26 x 46 to 30 x 50	23.50	22.00	19.00	
84 30 x 52 to 30 x 54	25.00	23.00	20.00	
90 30 x 56 to 34 x 56	26.00	24.00	22.00	
94 34 x 58 to 34 x 60	27.50	26.00	23.50	
100 36 x 60 to 40 x 60	31.00	28.00	26.00	

Double Thick.

Sizes.	1st. E F H D	2d. I E H D	3d. H H D	4th. H B D
25 6 x 8 to 10 x 15	$14.00	$13.50	$13.00	$12.25
40 11 x 14 to 16 x 24	17.00	16.00	15.25	14.50
50 18 x 22 to 20 x 30	22.00	20.50	19.00	
54 15 x 36 to 24 x 30	24.00	22.00	20.00	
60 26 x 28 to 24 x 36	26.00	24.00	21.75	
70 26 x 36 to 26 x 44	27.50	26.00	23.50	
80 26 x 46 to 30 x 50	30.00	28.00	24.50	
84 30 x 52 to 30 x 54	31.50	29.00	26.00	
90 30 x 56 to 34 x 56	33.00	30.50	28.00	
94 34 x 58 to 34 x 60	35.00	34.00	31.00	
100 36 x 60 to 40 x 60	38.00	36.00	34.00	

Sizes above—$15 per box extra for every 5 inches. Discount 70&10&10 @ 75&5 %.

PAPER STOCK, &c.

(*Dealers' Selling Prices.*)

	Cents ℔ lb.
White Shirt Cuttings, No. 1	6¾ @ 7
" " No. 2	5¾ @ 6
Mill Assorted Whites	5 @ 5½
Unbleached Muslins	5¾ @ 6
City Whites, No. 1	4½ @ ....
City Whites, No. 2	2¾ @ 2⅞
New Canton Flannels	5 @ 5¼
New Seconds, light	3¾ @ 4
" dark	3 @ 3¼
Cotton Canvas	4½ @ 4⅝
Linen Canvas No. 1	4 @ 4½
Seconds, City No. 1	1⅜ @ 1½
Seconds, City No. 2	1 @ 1¼
Colors, ℔ cwt	40 @ 50
Manila Rope	3 @ 3½
" Tarred	2½ @ 2¾
Gunny Bagging, No. 1	1¾ @ 1⅞
No. 2	1⅜ @ 1⅝
Kentucky Bagging	2 @ ....
Burlap Bagging, No. 1	2 @ 2¼
Tar Shakings	1⅝ @ 2
Hemp Twine Stock	3½ @ 3⅝
Hard White Shavings, No. 1	3½ @ 4
Soft White Shavings, No. 1	2¾ @ 3
White Shavings, No. 2, Soft	2½ @ 2⅝
Mixed Shavings, part White	2¼ @ 2⅜
Ledger and Writing	2¼ @ 2⅜
Solid Stock	2¼ @ 2¾
Book Stock, No 1, light	1 @ 1½
Old Newspapers	1¼ @ 1⅜
Pure Manilas	1¾ @ ....
Bagus Manilas and Hardwares, cwt	60 @ 100
Commons, ℔ 100 lb	40 @ 50
Binders' Board Cuttings	½ @ ⅝
Straw Board Cuttings, ℔ cwt	60 @ 70

PAINTS, OILS, &c.

Paints.

Black, Lamp—Coach Painters'	℔ lb 22 @ 24¢
" Ordinary	6¢
Black Ivory Drop, fair	12 @ 15¢
" " best	23¢
Black Paint, in oil	kegs, 8¢; assorted cans, 11¢
Blue, Prussian, fair to best	40 @ 55¢
" " in oil	45 @ 55¢
" Chinese dry	70¢
" Ultramarine	18 @ 30¢
Brown, Spanish	1½¢
" Van Dyke	10 @ 12¢
Dryers, Patent American	asst'd cans, 9¢; kegs, 7c
Green Chrome	15 @ 23¢
" in oil	14 @ 18 @ 25¢
" Paris	good, 20¢; best, 25¢
" in oil	good, 30¢; best, 35¢
Iron Paint, Bright Red	℔ lb 2½¢
" Brown	" 11¾¢
" Purple	" 3¢
Ground in oil, Bright Red	" 6¼¢
" " Red	" 5½¢
" " Brown	" 5½¢
" " Purple	" 6¢
Litharge	6½c
Mineral Paints	2 @ 4¢
Orange Mineral	10¢
Red Lead American	6½¢
" Venetian (Eng.) dry	$1.65 @ $1.70
" in oil	asst'd cans, 11¢; kegs, 8¢
" Indian Dry	9 @ 12¢
Rose Pink	10 @ 13
Sienna, American Raw, powdered	4¢
" Burnt, powdered	4½¢
" " in oil	10 @ 16 @ 20¢
" Raw	11 @ 15 @ 25¢
Umber, Burnt, powdered	4 @ 8¢
" " in oil	9 @ 12 @ 15¢
" Raw, powdered	4 @ 7½¢
" " in oil	9 @ 12 @ 15¢
Vermilion, Chinese	90¢
" English	53 @ 58¢
" American, Common	15¢
White Lead, American, pure dry	6¢
" " " in oil	6¼ @ 6½¢
White Paris, English Prime	2 @ 2½¢
Yellow Ochre, French	$1.75
" " in oil	asst'd cans, 11¢; kegs, 8¢
" " Vermont	in casks, 1½¢
Yellow Chrome	17 @ 27¢
" " in oil	14 @ 18 @ 25¢
Zinc White, American No. 1, dry	6 @ 6¢
" " No. 1, in oil	9¢
" French (Paris Dry)	5½ @ 7½¢
" in oil	10 @ 11¢

Oils.

Bleached Whale, ℔ gal	54 @ 55¢
" Sperm	$1.00
" Elephant	68¢
Drilling	40¢
B. & R. Best Valvone Cylinder	70¢
Engine	50¢
Fish Oil, Pressed	32 @ 34¢
Lard, Prime Winter	51 @ 52¢
" No. 1 Extra	49¢
Linseed, Raw, in casks and bbls	45 @ 46¢
" Boiled, " "	49 @ 50¢
" Western, " "	42 @ 43¢
Calcutta	49 @ 50
Machinery	40¢
Miners' Oil	35 @ 45¢
Neatsfoot	60 @ 70¢
Signal	50¢
Tallow	58¢
West Virginia	11 @ 18¢

Sundries.

Asphaltum, Cuban, ℔ lb	6½ @ 9¼¢
" Trinidad Refined	℔ ton, $27.80
Benzine	℔ gal. 8½ @ 9½¢
Chalk, ℔ 100 lb	45¢
" Block	80¢
Crucibles No. 14 and upward, per number	3½¢
Grain Emery, 300 lb kegs	3¾ @ 4¢
Flour Emery, finest quality	2½¢
Frostings	40c
Glue, White	℔ lb 35¢
" Sheet	20¢
Glaziers' Points, Zinc, ℔ box	$4.75
Gum, Copal	36¢
" Damar	25¢
" Shellac, English	30¢
" " dark	25¢
Mineral Wool, ordinary, ℔ lb	1 @ 1½¢
" extra	2 @ 3½¢
Pumice Stone, selected Lumps	3 @ 6¢
" powdered	2½ @ 3½
Pine Tar, bbls	$2.50 @ $2.75
Pitch	$1.60 @ $1.70
Plumbago E. I. Po., ℔ lb	4 @ 6¢
" American, ℔ lb	6 @ 10¢
" Gun Powder Glazing, ℔ lb	10¢
" Shot Polish ℔ lb	10¢
Putty, in bladders	2½¢
" in bulk	1½ @ 2
Rosin—Common and Good—Strained	$1.35
" E & F	$1.50 @ $1.75
" G & H	$2.00 @ $2.62½
" I & K	$3.62½ @ $4.15
" M & N	$4.75 @ $5.15
Spirits Turpentine, ℔ bbl	37 @ 38½¢
Stove Polish, Dixon's, ℔ gross	$5.50
" Rising Sun	" 5.50
" Gem	" 4.00
" Jet Black	" 3.00
Waste, No. 1 Cop	9¢
" No. 1 White Machine	9¢
" No. 2 White Machine	8½¢
" No. 1 Colored	6½c
" No. 2 Colored	6¢
" Washed Machine	8½¢
Whiting, Spanish, ℔ 100 lb	60¢

INDUSTRIAL ITEMS.

MAINE.

The rebuilt Katahdin Furnace will be blown in to-morrow. The stack is now 50 x 9½ and is equipped with a Cooper-Durham hot blast, a Weimer bell and hopper and seal, and two Davis-Colby desulphurizing kilns. Either water or steam power may be used. The output will probably be 200 tons per week of car-wheel iron. The company now controlling the furnace are known as the Katahdin Charcoal Iron Co.

CONNECTICUT.

The Meriden Cutlery Co. now have 275 hands in their employ and are running 12 hours per day.

H. B. Brown & Co., machinists, East Hampton, have settled with their creditors by agreeing to pay dollar for dollar, receiving an extension of time of payment, and are now running again.

MASSACHUSETTS.

About $40,000 of the $50,000 to be raised in Taunton for the new silver-plating company to be located there has already been assured.

David Bemis has withdrawn from the Leicester Wire Co., Leicester. The business will be conducted under the name of the Leicester Wire Co., the same as before, by J. Bradford Sargent, the former treasurer, and his brother, H. E. Sargent, both of whom have for some time been large owners in the company.

The tack business at Taunton is very dull just now, manufacturing having ceased, by order of the Central Mfg. Co., until the surplus stock has been worked off.

The American Tack Works, at Fairhaven, have shut down for an indefinite period.

The Morse Twist Drill Works, New Bedford, have commenced running on full time.

NEW YORK.

About 150 men have resumed work at the Morgan Iron Works of John Roach. It is said that 100 more will be taken on during the week.

Haight & Clark, iron founders, of Albany, issue a circular letter under date of the 9th inst., from which we quote as follows: "We take pleasure in announcing that we shall remove to our new foundry on Pleasant street, above North Pearl, on or about November 12. Our new plant will be complete throughout with new and improved machinery and a melting capacity of 12 to 15 tons per day. All work intrusted to us shall be first class in every particular, and promptly made and shipped. We shall be enabled to drill and fit up work complete when our customers desire it. One story of the main building will be set apart exclusively for nickel-plating, and that department will be under the supervision of an experienced man. We shall also do japanning, bronzing and ornamenting in all its branches."

NEW JERSEY.

The American Steel and Iron Works, at Phillipsburg, have completed a new furnace designed to clean sheet iron by the Western process. This is said to be the only furnace of the kind ever put in operation east of the Alleghenies.

PENNSYLVANIA.

The employees at the P. & R. car shops, Reading, were put on nine hours time last week. The men have been working 10 hours for some time. This is equivalent to a reduction of about 15 cents a day, and affects about 700 employees.

An application was filed last week for a charter to the Keystone Lead and Zinc Co., of Philadelphia; capital stock, $50,000. The stockholders are Jacob H. Gobel, Henry H. Gobel, Samuel S. Campbell and William M. Hobart, of Pottstown; William B. Schaffer, of Allentown, and J. Howard Gendall, of Philadelphia.

Jefferson Furnace (charcoal) is now in successful operation. About 44 tons of cold-blast charcoal iron are turned out every 24 hours.

The puddle helpers of the Lebanon Iron Company Works, who went out on a strike, have returned to work.

It is rumored that a wire-fencing factory will shortly be established at Reading.

Robesonia Furnace (anthracite) is producing 120 tons of iron daily. This furnace has a capacity of 150 tons per day. The furnace was only blown in recently, and the production is considered extraordinary for so short a time.

Boyts, Porter & Co., of Connelsville, received an order a few days ago for a carload of oré-crushing machinery, to be shipped to Butte City, Mon. This is the second order of that size within the past six weeks.

The machine shops of the Allentown Rolling Mill are running night and day, full-handed, on orders of considerable importance. Business at the mills has also picked up.

Ritter & Saylor's fire-brick works at Allentown have enough orders on hand to keep the works running until spring.

At a meeting of the bondholders of the defunct Huntingdon Car Works, held at Huntingdon last week, to take final action on the proposition of Messrs. A. & P. Roberts and Charles Scott, of Philadelphia, to purchase the works for $20,000, an acceptance of the proposition was unanimously agreed to and a committee appointed to meet in Philadelphia and close the terms of sale. One of the conditions agreed upon is that the works shall not be removed from Huntingdon.

The Harrisburg Car Co. have secured a contract for the construction of 200 cars for the Lehigh and Hudson Railroad. This is the first contract had by the company for several years. About 150 men will be employed in manufacturing the cars.

The report that the Catasauqua Mfg. Co. were about to lease the Glendower Rolling Mill is denied by Mr. Oliver Williams, the president of the Catasauqua Mfg. Co. Mr. Williams states that it is only with the hardest work that he can keep his present mills running, with little or no profit, and there certainly is no inducement in adding to his cares by taking another mill, especially in view of the uncertainties of the business outlook, in the prospect of disturbing legislation by a tariff reform administration.

The Pittsburgh Steel Casting Co. have just finished a train of steel rolls for the Pencoyd Iron Works, Philadelphia. Each roll weighed 5 tons.

The Pennsylvania Car Works, at Latrobe, owned by S. R. & H. Baker, have resumed operations, employing about 50 men. They have been idle about a year.

The car shops at Altoona have orders on hand for 600 box and gondola cars.

Orr, Painter & Co.'s stove foundry, at Reading, have again resumed operations.

The Lochiel Rolling Mill, Harrisburg, which has been lying idle for a number of years, has been secured on a five years' lease by Danville capitalists, and will be put into operation as soon as the necessary changes in the machinery can be made. The lessees, who are Ed. Sayre Gearhart, Col. C. W. Eckman, A. Creveling and Charles H. Reynolds, all of Danville, propose manufacturing skelp iron. Not less than 300 men will be employed. The managers expect to be in shape to begin work by the 1st of December. A contract has been made with the American Tube Works, at Middletown, which works will use a large amount of the production of the mill. An organization has been effected by the election of Mr. Gearhart as president, from whom we learn that the puddling department will be ready for operation in about two weeks. Iron skelp will be made in sizes from 15 inches down to 5 inches, and the product of the works will be about 80 tons per day.

The Glamorgan Iron Co., of Lewistown, are running but one of their two stacks. The one in operation is 70 feet high, with 15-foot boshes, and makes 350 tons per week. The boilers and engine have been removed from the other furnace, and it may never be operated again.

PITTSBURGH AND VICINITY.

The old Eagle Mill property, at the Allegheny end of the Northside Bridge, was purchased last Saturday by Mr. George Shiras, Jr., for $100,000.

On the 6th of February, 1884, the fires were put out in the Iron City Forge Works, near Summer Station, in Sharpsburg, and since then the wheels have remained motionless. The property passed into the hands of Mr. Chaffee, of Pittsburgh, and a few weeks ago he leased it to Messrs. McKim & Smith, who have formed a company called the Twin City Forging Co. They have leased it for five years with the privelege of buying. There will be an engine, two boilers, a large 3-ton steam hammer, a fan, three pumps and a heating furnace used. The workmen are now busy putting the building in order.

Zug & Co., Pittsburgh, have nearly completed a new heating furnace for their 10-inch mill. The new heater will have double the capacity of the old one.

Shoenberger & Co., Pittsburgh, are building a Bessemer plant, which they expect to have in operation in about five weeks.

A new sheet mill and glass factory is spoken of for Leechburg.

The Pittsburgh Steel Casting Co. are meeting with great success in the manufacture of large Bessemer and crucible steel rolls. The Phœnix Iron Co., at Phœnixville, have in use rolls weighing from 4000 to 7500 pounds, four of them in service since 1882. A. & P. Roberts & Co have in use very large rolls, some of them weighing over 10,000 pounds each. Orders are now being filled for Carnegie Bros. & Co., Cambria Iron Co., Pennsylvania Bolt and Nut Co., Sharon Iron Co. and the South Tredegar Iron Co.

The 10-inch mill at the Republic Iron Works went on double turn last week for the first time during this year. Orders are crowding on them, there being an order for 740 tons of pipe from one firm.

A number of mills in the lower part of Allegheny are running at night instead of during the day. The cause of this change is the lack of natural gas in the daytime. There are so many consumers that the mills cannot find enough pressure to run. Among those that are thus running are Smith, Sutton & Co. and Lindsay, McCutcheon & Co.'s mills.

Stewart McKee, a millionaire glass manufacturer, and one of the best known citizens of Pittsburgh, died suddenly last week, aged 40 years.

The Edgar Thomson Steel Works have begun the erection of a new blast furnace and four stoves. When completed this will make a plant of five furnaces, with a capacity of 1000 tons per week each, together with Furnace A, whose capacity is considerably less.

Southside manufacturers are reviving the old scheme of building a bridge across the Monongahela at Soho, with a capital of $200,000.

The work of metal carrying at Shoenberger's mill has been let out at contract. The 10 metal-carriers struck for higher wages.

The strike of the river coal miners seems to be broken. There are 75 men working at Neel's two Fourth Pool mines, 20 at T. J. Wood's, and 25 at the Globe. It is also said that the Umpire, Stony Hill, Tremont, Clipper, Cedar Hill, Carondelet and Knob mines in the Fourth Pool are running, the Knob and Umpire at 1¼ cents, the others at 2 cents.

The foundry of Fisher, Thomas & Co., on the Southside, was burnt down on Tuesday of last week. Loss, $30,000.

In addition to the 5 per cent. of the dead coke ovens of the syndicate ordered to be fired up last week, work is now progressing looking toward the firing up of 5 per cent. more. This will put in blast 70 per cent. of the 7628 ovens controlled by the syndicate, with good prospects of "5 per cent. more being fired before Saturday."

The H. C. Frick Coke Co., of Pittsburgh, have purchased an interest in the coke works of the Chicago and Connellsville Coke Co., situated at Leith, 1 mile south from Uniontown. The Frick Co. will run the works, and the coke, as heretofore, will be taken by the Joliet Steel Co., who are large owners in the works. The interest purchased by the Frick Co. is one-third, but the consideration is not known.

Messrs. Armstrong Bros., of Pittsburgh, were in Rochester last week to meet a committee from the Wampum Wire Co.'s Works, at Wampum. The object of the meeting was to examine the large building owned by Armstrong Bros. & Co., in Rochester, and make arrangements for the formation of a company to manufacture steel wire and nails.

Rebecca Furnace, Kittanning, which has just blown in after repairs, is running entirely on native ores—a new feature. The product is made into bridge iron, and, from tests made, shows an exceedingly high tensile strength. The present run of this company's mills is the longest since the works started.

James Lappan & Co., Pittsburgh, proprietors of the Iron City Bridge Works, are building a large mashtub, kettle, meal and grain scale hoppers and other tanks for Z. Wainwright & Co. They are also at work on a battery of four iron boilers for Long & Co., of Charliers, and have just finished a lot of work for the new Bessemer plant of Schoenberger & Co., among which were a large hood and stack, a blast-pipe, &c.

OHIO.

It was reported last week that the iron mills of Brown, Bonnell & Co., at Youngstown, would be sold at auction on Tuesday last, the 17th.

The owners of the various furnaces in the Hocking Valley have decided, for the present, at least, to keep the furnaces running, and, owing to the strike of the coal miners, have arranged to use coke for fuel until the men see fit to return to work. It is claimed that coke can be brought from Connellsville and landed at the furnaces, nearly 300 miles from the Hocking Valley, at a trifle higher figure than the cost of the coal.

The Morse Bridge Co., of Youngstown, are crowded with orders, and report great delays in getting special iron for bridges.

Negotiations are being made to secure the lease or purchase of the Russia Mill, at Niles. The parties who are endeavoring to secure the mill are said to be experienced millmen and capitalists.

The Otis Iron and Steel Co., Cleveland, have ordered four Westinghouse engines of 200, 35, 25 and 8 horse-power, respectively. This is the tenth order received from the Otis Co. within three years. The 200-horse-power engine is 18 x 36 inches, and will be coupled directly to a train of rolls making 300 revolutions.

Star Furnace, in the Hanging Rock region, blew out on November 8.

Benwood Furnace, at Martin's Ferry, will soon be put in blast.

George W. McKim is building a small machine shop at Martin's Ferry for the manufacture of his patent nail feeder and a special line of nail keg and stave machinery. He will be in full operation by December 1.

ILLINOIS.

The Riverside Steel Casting Co., makers of crucible steel castings, are a new enterprise which have just taken possession of the old Phœnix Iron Foundry, Chicago. They are building new furnaces for melting steel and are putting in annealing ovens. The officers of the company are C. W. Pierce, president; W. S. Brewster, vice-president; J. F. Brown, secretary and treasurer, and H. H. Pierce, general manager. The capital stock is $250,000.

The new factory building of the Crane Brothers Mfg. Co., Chicago, will be ready for occupation in about two weeks.

The wrench department of Owsley Brothers' works, Chicago, is taxed to its utmost capacity in orders, and is to be enlarged. This firm have recently placed in their works a number of special machines of their own design.

On Thursday week the Block & Hartmann Smelting Co. were organized at East St. Louis, capital $150,000, with Messrs. John C. H. D. Block, Louis Denstrow and Gustavus Finkelnburg, all of St. Louis, as incorporators. The company's works will be located at Belleville, and the work of construction will be commenced at an early day.

The mills of the Union Iron and Steel Co., at Bridgeport, are to be opened for business within a week.

P. D. Armour, the pork packer, of Chicago, is going into the iron business on a small scale. He has purchased a tract of land adjoining his slaughter-house in the stockyards district, and in a few weeks will begin operations for the construction of a blast furnace and rolling mill wherein will be made all the ironwork necessary in carrying on his business.

The mills of the North Chicago Rolling Mill Co., at South Chicago, continue in full blast.

MICHIGAN.

Since it last went into blast Vulcan Furnace, at Newberry, has been producing an average of 55 tons of pig iron daily, and is working satisfactorily in every respect.

The Norway *Current* states that the Penn Iron Co.'s five mines, these being the Quinnesec, Norway, Cyclops, West Vulcan and East Vulcan, have quit shipping ore for the season. The output of the mines named up to date aggregates 235,417 gross tons.

Last week's shipments brought the total amount of iron ore forwarded by lake from the mines of the Marquette and Menominee and Gogebic and Vermillion ranges up to 2,195,072 gross tons. At the corresponding date last year the Lake shipments from this and the Menominee range had reached 2,303,737 gross tons, or 108,665 tons more than the quantity sent to market from all four ranges thus far this season.—*Mining Journal.*

MISSOURI.

The South St. Louis Foundry are melting 10 tons of iron daily in their pipe department and are behind orders.

The Helmbacher Forge and Rolling Mills Co., St. Louis, started up their muck train again last week, but were uncertain as to how long they would continue it in operation. Five furnaces are employed in connection therewith, but no puddling is done.

The St. Louis Smelting and Refining Co. have purchased a Westinghouse engine of 100 horse-power.

MINNESOTA.

The work of building the new mill of the Northwestern Iron Co., at Minneapolis, is progressing. The owners are Messrs. Morgan, Williams & Co. The mill will be ready by January 1, 1886. Mr. Williams was formerly a resident of Pittsburgh.

WEST VIRGINIA.

A certificate of incorporation has been issued by Secretary of State Walker to the Beaver Falls Iron Co., formed for the purpose of manufacturing and dealing in sheet iron and steel, and boring for natural gas and transporting the same by means of pipes or otherwise for public as well as private use. The principal office is to be at Beaver Falls, Pa., and the charter is to expire on the 24th day of October, 1935. For the purpose of forming such corporation $500 has been subscribed, of which amount $50 has been paid in, with the privilege of increasing the same to $100,000 in all. The shares are of the value of $100 each, and are held as follows: Nelson E. Whitaker, Edward C. Ewing, Loring Downs, Edward L. Pratt and William P. Hubbard, all of Wheeling, one share each. The company, it is understood, have secured control of the old McKee-Anderson mill, which has been idle for some time, and will repair and remodel the same.

ALABAMA.

A surveying party is in the field between Jasper and Birmingham, on its way to the latter place, making a preliminary survey for the contemplated extension of the Memphis, Birmingham and Atlantic Railroad, and Receiver Erb, from whom the Virginia purchasers get the road, is authority for the statement that all the money the extension will require is in hand.

Sloss Furnace No. 1, at Birmingham, having been repaired, was blown in on the 17th.

Rock Run Furnace, Cherokee County, is undergoing repairs and will soon be ready to blow in.

The Gadsden Furnace, which recently went into blast again, is making more, as well as better, iron than ever before.

It is announced that work will begin on the English investors' furnace in Talladega County.

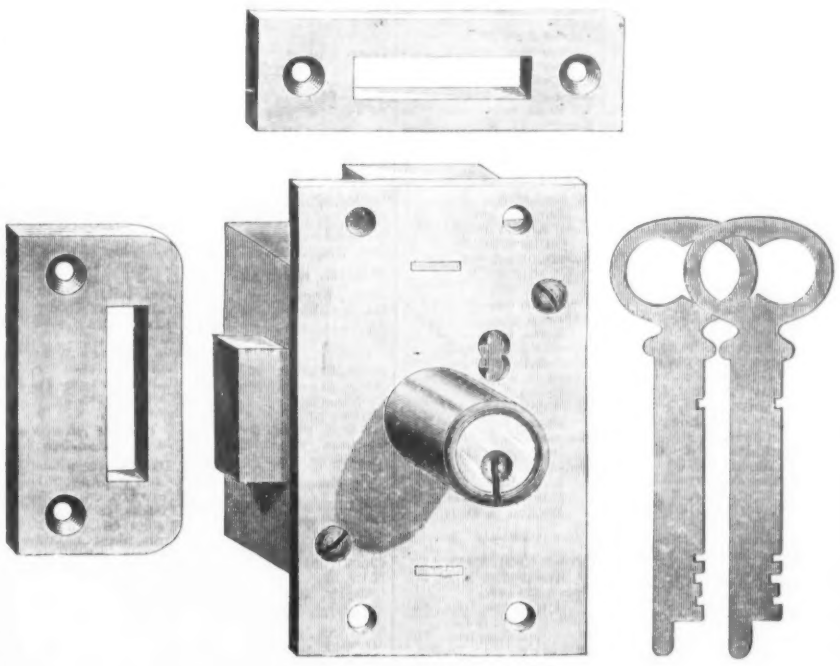
GEORGIA.

Etna Furnace, which has been out of blast for some weeks getting up stock, blew in again early in the present month.

HARDWARE NOVELTIES.

Double Bolt Wardrobe Lock.

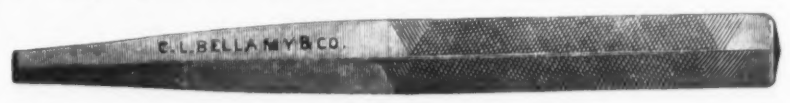
The accompanying illustration represents a new Wardrobe Lock made by the Eagle Lock Co., Terryville, Conn., and 98 Chambers street, New York. It is intended to take the place on double doors of the regular wardrobe lock and its accompanying flush-bolts and inside hooks. That it may accomplish this, it will be seen that it has one bolt on top that locks into the under side of a shelf, and a side bolt that at the same time locks into a strike-plate attached to the opposite door. By this means both doors are fastened or unfastened simultaneously, the locking or unlocking of both bolts being by the same turn of the key. The lock is represented full size, is designated as No. 1049, has three tumblers and flat key, and lists at $10.50. The convenience of fastening and unfastening both doors at once will be appreciated, as well as the advantages resulting from dispensing with the flush-bolts, hooks and other contrivances which are commonly used.



Double Bolt Wardrobe Lock.

Nail Set.

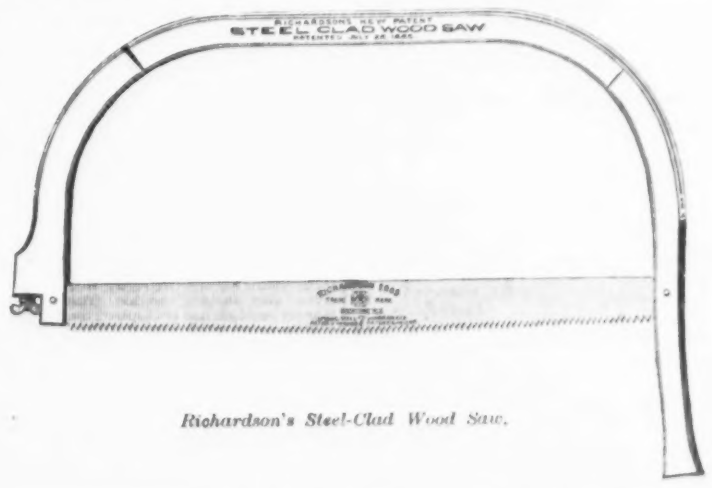
C. L. Bellamy & Co., Newark, N. J., for whom Sise, Gibson & Co., are agents, 100 Chambers street, New York, are putting on the market the Nail Set represented in the accompanying illustration. The special feature of this article, to which they direct attention as novel, is the manner in which, as shown in the cut, it is made rough for convenient handling.



Nail Set.

Richardson's Steel-Clad Wood Saw.

The accompanying engraving represents a new form of buck-saw, being introduced by Richardson Bros., of Newark, N. J., proprietors of Richardson's Saw Works. The peculiarity is the method of straining the frame. The tool is known as Richardson's Steel-Clad Wood-Saw, and is manufactured under a recent patent. The frame, as will be seen by the engraving, is cut in the arch at both the right and the left. It is surrounded by a band of steel, one end of which is fastened in place by riveting, being the end next the handle, while the opposite end terminates in a threaded section fitted with a thumb-screw arranged for drawing it tight. The sections of the frame are arranged to make clamping by this screw easy and effective, and to produce a light frame, which at the same time is very strong. All the slack is readily taken up from the saw blade, while leaving the parts so disposed as to readily disengage it for filing or other purposes. Among the special advantages to which the makers direct attention are the amount of cutting space that it gives, while it also does away with the much complained of old-fashioned stretcher and cross-bar. The band described acts as both strainer and stiffener, and makes the frame complete and strong.



Richardson's Steel-Clad Wood Saw.

Imports.

The following were the Imports of Hardware, Iron, Steel and Metals into the Port of New York for the week ending Nov. 18, 1885:

Hardware.

Armitage H. G.
Chains, 2
Arnot J. H.
Box, 1
Barbour Bros. & Co.
Machinery, cs., 4
Berbecker J. & Co.
Nails, cs., 33.
Boker Hermann, & Co.
Hardware, cutlery and guns, pkgs, 74
Clark Mile End Co.
Machinery, cs., 50
Curley J. & Bros.
Cutlery, cs., 9
Degrauw, Aymar & Co.
Chains, 16
Chains, cks., 2
Dietrich & Co.
Machinery, pkgs., 4
Field Alfred & Co.
Mdse., 6
Ferrie J. W.
Machinery, cs., 19
Frasse P. A. & Co.
Mdse., case, 1
Gerdan Otto,
Mdse., cs., 2
Hardware, bdls., 534
Hartley & Graham,
Mdse., cs., 3
Holbrook Bros.
Case, 1
Markt & Co.
Mdse., cs., 15
Moore's Sons J. P.
Fish hooks, cs., 2
Newton & Shipman,
Files, cs., 2
Negus T. S. & J. D.
Mdse., case, 1
Planque Emil de,
Cases, 25
Risthal A. D. & Co.
Mdse., cs., 7
Russel & Erwin Mfg. Co.
Skates, cs., 2
Schoverling, Daly & Gales,
Mdse., cs., 29
Seymour Cutlery Co.
Mdse., case, 1
Sheldon G. W. & Co.
Machinery, pkgs., 10
Vom Cleff & Co.
Mdse., cs., 14
Wiebusch & Hilger,
Hdw. & cut'y, pgs., 64
Winchester Arms Co.
Rifles, case, 1
Witte John G. & Bro.
Needles, case, 1
Yule Geo.
Machinery, cs., 2
Metal weights, 2
Order,
Wire polishing machines, case, 1
Machinery, cks., 6
Cases, 38
Cutlery, cs., 4

Iron

Baring Bros. & Co.
Nail rods, bdls., 4499
Bars, 2695
Rods, bdls., 950
Wire rods, coils, 4860
Coddington T. B. & Co.
Sheets, bxs., 11
Sheets, bdls., 595
Lillienberg, N,
Nail rods, bdls, 28
Rivet rods, bdls., 123
Lundberg, Gust,
Bundles, 255
Mason John W. & Co,
Wire rope, coils, 4
McNider James,
Clamps, 2
Naylor & Co.
Bars, 702
Stetson Geo. W. & Co.
Pig, tons, 250
Wood, Niebuhr & Co.
Wire, coils, 389
Order,
Tubes, 61
Bars, 770
Rivet rods, coils, 292

Steel

Abbott Jere & Co.
Cases, 8
Baltzer & Lichtenstein,
Rods, bdls., 466
Baring Bros. & Co.
Rods, bdls., 4157
Beecher H. W.
Packages, 33
Cary & Moen,
Bundles, 1045
Downing R. F. & Co.
Slabs, 48
Blooms, 140
Field Alfred & Co.
Cutlery, cs., 3
Hammacher, Schlemmer & Co.
Wire, cs., 4
Nails, cs., 40
Naylor & Co.
Rods, bdls., 4174
Newton & Shipman,
Bundles, 69
Bars, 37
Cases, 8
Rawlings G. E.
Cases, 10
Wagner W. F.
Packages, 111
Order,
Rods, bdls., 6846
Nail rods, bdls., 1127
Packages, 41

Metals

Brown Bros. & Co.
Tin plates, bxs., 425
Bruce & Cook,
Tin plates, bxs., 50
Baring Bros. & Co.
Tin plates, bxs., 770
Dickerson, Van Dusen & Co.
Tin plates, bxs., 1211
Elwell Jas. W. & Co.
Old metal, bxs., 3
Mersick C. S. & Co.
Tin plates, bxs., 295
Montell F. T. & Co.
Old metal, brass, &c., pkgs., 8
Naylor & Co.
Tin slabs, 983
Spelter, plates, 9199
Phelps, Dodge & Co.
Tin plates, bxs., 13,083
Black taggers, bxs., 292
Winter & Smillie,
Plumbago, bbls., 359
Order,
Tin plates, bxs., 4489
Tin taggers, bxs., 222
Plumbago, bbls., 1052
Tin, slabs, 951
Lead, pigs, 805
Taggers, bxs., 370
Spelter, plates, 4584
Zinc oxide, bbls., 100

The imports of Cutlery, Metals and Hardware during the week ended November 13, were as follows:

	Quantity.	Value.
Brass goods	29	$2,405
Bronzes	47	6,108
Chains and anchors	55	2,339
Clocks	55	5,596
Copper	....	17,069
Cutlery	36	36,884
Guns	71	10,258
Hardware	44	2,831
Iron, pig, tons	1,529	28,588
Iron, sheet, tons	28	2,211
Iron ore, tons	790	1,287
Iron, other, tons	341	12,269
Lead, pigs	390	1,677
Machinery	238	13,124
Metal goods	345	30,278
Needles	19	4,975
Nickel	6	1,749
Old metal	....	40
Platina	1	1,109
Plated-ware	12	628
Percussion caps	24	3,826
Pins	6	957
Saddlery	37	3,443
Steel	80,179	65,739
Tin, bxs	42,670	171,414
Tin, 4,780 slabs; lb	363,870	72,659
Wire	10	2,079
Zinc oxide	205	1,969

The comparison since January 1 for two years is as follows:

	46 weeks of 1885.	Same time 1884.
Cutlery, pkgs	4,198	4,705
Hardware, pkgs	753	647
Iron, R. R., bars	7,560	9,422
Lead, pigs	35,574	36,728
Steel, pkgs	2,025,580	1,552,699
Tin, bxs	1,683,014	1,722,246
Tin slabs, lb	18,235,213	22,197,320

Exports.

The following list embraces the Exports of Hardware, Machinery, Iron, Metals, &c., from the Port of New York, for the week ending November 17, 1885:

Dutch West Indies.

	Quan.	Val.
Sew. ma., cs.	3	56
Mf. iron, pkge	1	42
Sugar mill	1	147

Amsterdam.

Hdw., cs.	21	408
Sew. ma., cs.	70	2,683

Christiania.

Wringers, cs.	3	40

Danish West Indies.

Mach'y, pkgs.	13	444
Hdw., cs.	21	146
Mf. iron, pkgs.	44	219
Torpedos, cs.	10	34
Pumps, pkgs.	2	14
Nails, kegs	24	84
Tacks, cs	6	55

Hamburg.

Clocks, pkgs.	82	2 039
Mf. iron, pkgs	8	896
Mach'y, pkgs.	52	4,120
Tinware, cs.	5	150
Hdw., pkgs.	202	4,359
Sew. ma., cs.	713	18,117
Nails, kegs	10	31
Cutlery, cs	4	524
Copper, cks.	36	4 500

Copenhagen.

Clocks, cs.	20	524
Hdw., cs.	26	350

St. Petersburg.

Revolvers, cs.	3	1,630
Ctge. shells, cs	2	40
Cartridges, case	1	27
Hdw., cs.	3	48

Stockholm.

	Quan.	Val.
Pumps, pkge.	1	250
Mf. iron, pkgs	2	45

Rotterdam.

Pumps, pkgs.	7	405

London.

Ag. imp., pkgs	17	921
Clocks, pkgs.	22	812
Saws, cs.	24	87
Mf. iron, pkgs	4	192
Hdw., pkgs.	2	18
Wringers, cs.	28	340

Antwerp.

Hdw., cs.	26	556
Mach'y, pkgs.	16	1,393
Sew. ma., cs.	87	1,795

Liverpool.

Copper matte, bags	6700	41,900
Copper ore, bags	7073	37,900
Mf. iron, pkgs	87	494
Sew. ma., cs.	113	5,395
Metal goods, case	1	40
Saws, case	1	100
Scales, cs	22	405
Wringers, cs.	2	5
Ctge. shells, case	1	20
Pumps, pkgs.	9	471
M. rollers, cs.	5126	1,234
Ag. imp., pkgs	24	405
Hdw., pkgs.	84	3,366
Clocks, cs	365	10,088
Mach'y, pkgs.	92	6,673
Guns, cs.	6	886
Purifiers, bxs.	12	885
Brass sprinklers, bxs.	14	1,000

Bremen.

	Quan.	Val.
Hdw., pkgs.	7	103
Ag. imp., pkgs	13	228
Mf. iron, pkgs	28	834
Cutlery, case	1	75
Sleigh bells, case	1	63
Wire goods, case	1	295

Glasgow.

Ag. imp., pkgs	5	500
Cutlery, case	1	301
Mf. iron, pkgs	8	110
Clocks, pkgs.	65	1,051
Pumps, pkgs.	9	590
Hdw., pkgs.	21	782
Sew. ma., cs.	548	5,457

Avonmouth.

Mf. iron, pkge	1	100
Hdw., case	1	125

Hull.

Hdw., cs.	111	1,728
Clocks, pkgs.	26	295
Pumps, pkgs.	9	193

Leith.

Hdw., cs.	7	184
Ag. imp., pkgs	6	50

Canada.

Eyelet hooks, cs	2	340
Antimony, bbls	5	173

Newfoundland.

Hdw., cs.	3	91
Steel tires	8	153
Sew. ma., cs.	7	114

British West Indies.

Hdw., pkgs.	66	461
Mach'y, pkgs.	3	182
Ag. imp., pkgs.	2	23
St'mp'd ware, case	1	40
Nails, kegs	37	112
Nails, pkgs.	7	42
Smoke-stack	1	25
Scales, cs.	4	40
Mf. iron, pkgs	58	283
Sew. ma., cs.	3	35
Clocks, cs.	2	22

Nova Scotia.

Ag. imp., pkgs	7	24
Granite ware, case	1	52
Sew. ma., cse.	1	81
Clocks, cs.	15	377
Hdw., cs	3	68
Cutlery, case	1	30

British Honduras.

Sew. ma., cs.	14	261
Mf. iron, pkgs	65	120
Hdw., pkgs.	14	151
Shot, pkgs.	40	150
Cutlery, cs.	10	166
Ag. imp., pkgs	12	72
Scales, cs.	13	42
Nails, kegs	17	51

British Possessions in Africa.

Ag. imp., pkgs	30	703
Mach'y, pkgs.	2	150
Scales, cs	7	45
Nails, kegs	89	220
Nails, cs.	2	24
Mf. iron, pkgs	2	60
W. mill mat'l, pkgs	36	410
Pumps, pkgs.	13	692
Hdw. pkgs.	14	641
Cartridges, cs	2	50
Sew. ma., cs.	12	581

Havre.

Pumps, pkgs.	2	29
Agl. imp., pkgs	6	695
Bullets, cs.	4	46
Mach'y, pkgs.	2	100
Copper, cks.	1,152	27,758
Mf. steel, cs.	9	670
Guns, cs.	2	208

Barcelona.

Mf. iron, pkgs	21	287

Marseilles.

Mach'y, pkge.	1	50

Miquelon.

Mf. iron, pkge	1	13

Cuba.

Mf. iron, pkgs	473	2,505
Hdw., pkgs.	120	1,330
Cutlery, cs.	41	938
Clocks, cs.	11	271
Locomotive	1	4,992
Pumps, pkgs.	3	98
Nails, cs.	2	98
Tinware, hhds	2	280
Car wheels	182	1,155
Steel, pkgs.	113	508
Rivets, kegs	35	99
Tacks, cs.	4	35
Mach'y, pkgs.	394	15,270
Nails, kegs	295	900
Spikes, kegs	199	685
Agl. imp., pkgs	24	1,266
Cars	3	2,089
W. cloth, cs.	9	268
Iron, pkgs.	175	545
Boilers	2	2,350
Copper sheets	14	461
Saw	1	88

St. Michaels.

Hdw., case	1	82
Agl. imp., pkgs	4	46

San Domingo.

	Quan.	Val.
Iron, pkgs.	29	72
Hdw., pkgs.	25	447
Mf. iron, pkgs	10	89
Nails, kegs	42	150
Y. metal sht'g, cs.	3	155
Pump	1	80
Tinware, cs.	4	36
Clocks, pkgs.	4	92

Lisbon.

Ptg. presses, bxs	3	93
Clocks, cs.	10	117

Naples.

Hdw., cs.	11	181
Pumps, pkgs.	3	575

Brazil.

Mach'y, pkgs.	1455	56,165
Pumps, pkgs.	26	1,016
Clocks, pkgs.	68	1,535
Cott. gins, cs.	11	525
Hdw., pkgs.	71	1,462
Cutlery, cs.	19	308
W. wheel	1	174
Air guns, case	1	50
Shot, cs.	2	35
Cartridges, cs	7	130
Ag. imp., pkgs.	18	521
Mf. iron, pkgs	57	698
Firearms, cs.	2	948
Sew. ma., cs.	33	763
C. wheels & a., pairs	30	250
Nails, cs.	13	74

Mexico.

Nails, kegs	152	438
Mf. iron, pkgs.	66	602
Mach'y, pkgs.	12	678
Iron, bdls.	10	23
Nails, box	1	20
Hdw., pkgs.	38	537
Saw	1	3
Shot, pkgs.	26	147
Knit. ma., cse.	1	28
Cartridges, cs	17	681
Tacks, case	1	12
Sew. ma., cs.	6	98

United States of Colombia.

Mf. iron, pkgs	332	3,118
Mach'y, pkgs.	261	7,012
Tinware, cs.	24	386
Pistols, cs.	5	874
Tacks, cs.	7	62
Iron, pkgs	343	915
Ag. imp., pkge	1	9
Steel, pkgs.	9	111
Saws, cs.	7	1,635
Closet	1	34
Quicksilver, flks	4	129
Pumps, pkgs.	2	13
Hdw., pkgs.	383	4,689
Cutlery, pkgs	20	427
Sew. ma., cs.	129	3,609
Iron tanks	2	240
S. pumps	5	395
Clocks, cs.	12	685
Cartridges, cs	19	547
Firearms, cs.	8	489
Nails, cs.	4	115
Iron pipes	24	2,478
Nails, kegs	28	71
Iron bridge	1	4,500
Coolers	50	1,100

Oporto.

Stampedware, cs.	16	389

Venezuela.

Mf. iron, pkgs.	374	2,504
Iron, pkgs.	345	1,497
Hdw., pkgs.	90	1,014
Cartridges, cs	10	220
Iron columns	6	300
Cutlery, cs.	5	69
Ag. imp., pkgs	17	86
Clocks, cs.	7	197
Nails, bxs.	7	29
Turn-table	1	190
Nails, kegs	73	225
Carbines, cs.	2	571
Mach'y, pkgs.	21	2,276
Saws, cs.	8	245
Pumps, pkgs.	6	200
Sew. ma., cs.	47	1,868
Railroad cars	15	2,206

Genoa.

Hdw., cs.	9	259
Sew. ma., cs.	84	1,400
Clocks, cs	42	1,030

Hayti.

Hdw., cs.	2	37
Mf. iron, pkgs.	2	23
Clocks, cs	2	34
Nails, kegs	54	149
Tinware, case	1	22

Argentine Republic.

Ag. imp., pkgs	402	9,444
Sew. ma. cs.	207	4,192
Scales, cs.	65	1,025
Pumps, pkgs.	5	516
Saws, cs.	4	40
Hdw., pkgs.	245	5,121
Clocks, cs.	92	2,589
Cutlery, case	1	52
Mf. iron, pkgs	4	98

Peru.

Engine	1	260
Sew. ma., cs.	12	250
Hdw., cs.	14	257
Ag. imp., pkge	1	10
Pumps, pkgs.	3	150
Tacks, case	1	20
Firearms, cse.	1	25
Mf. iron, pkge	1	15

Foreign Markets.

FRANCE.

PARIS, November 6, 1885.—*Metals.*—Politics being out of the way, business has been slowly improving, with a better demand for Metals, but no better prices; on the contrary, Copper and Spelter have been a little lower during the week and close at the decline. We quote: *Copper.*—Chili Bars, 102.50 @ 105 francs, ℔ 100 kg; Ingots and Slabs, 112.50; Best Selected, 115, and Pure Corocoro Ore, 105. *Tin.*—Banca, 249.50; Billiton, 247; Straits, 244.25; Australian, 245, and English, 239. *Lead*, 28.25 @ 29.25, and *Spelter*, 37.50 @ 38. *Iron.*—In this city the market has continued inanimate at 13 @ 13.50 francs nominally. The report from St. Dizier reads as follows: There has been a slight falling off in the iron demand, but prices have nevertheless been sustained at 14 francs ℔ 100 kg. for Coke Merchant and 15 @ 15.50 for Mixed. Machine has been firmer at 16 @ 16.25 for Wire. The Doulaincourt Rolling Mills have secured the Government contract to run for three years for the Guériguy Workshops. We receive the ensuing advice from Valenciennes: Hardly enough has transpired during the week to enable us to give you the quotations, which are 12.50 @ 13 for Merchant, for orders spread over the next three months. One of the rolling mills in this basin has reduced the price by circular ½ franc ℔ 100 kg. Iron merchants in this vicinity are very much discouraged, having lost money on every lot they handled during the uninterruptedly downward course of prices. Horseshoes, which were selling at 30 francs ℔ 100 kg. in January, can now be had for 23.50. Hardware orders have been reviving. *Coal* is firm, but unaltered.—*Moniteur des Intérêts Matériels*

BELGIUM.

BRUSSELS, November 6, 1885.—*Iron.*—The Iron situation in the Belgian districts has undergone no essential change during the week. Business continues slack and prices are weak for every article in the Iron line, nor is there the slightest indication of a speedy change for the better. Nothing, indeed, can so near the dull winter season be productive of some relief from the prevailing deadlock but a material general reduction of output in every branch, but harmony of action among makers in this item in a country like ours is a difficult matter, not to say an impossibility. Nor is it likely that a serious attempt will be made in that direction. If export orders from Eastern countries were to drop in again there would at least be some relief, but Java sends none at present, and in the Levant the Bulgarian troubles and uncertain outlook arising therefrom have even spoiled the headway we were making in the sale of our Iron and Steel on the Balkan Peninsula. In view of this dismal state of affairs the Government has resolved to do at least something, and has ordered the building of 40 miles of railway, all Iron and Steel, sleepers included. Although this seems a small matter, it is welcome at this precise moment, when everything began to fail us. Cockerill has also got some artillery orders from Spain. Meanwhile Pig Iron has dropped to a point lower than ever, 3.90 francs ℔ 100 kg. for Puddling Pig, at which Athus is offering the same. *Coal* has been moderately active, but firmer, without a quotable advance so far.—*Moniteur Industriel.*

GERMANY.

HAMBURG, November 6, 1885.—*Iron.*—There has been no improvement in the Iron situation either in Rhenish Westphalia or Upper Silesia; business is dragging, and in the Siegen district another blast furnace has been blown out, no doubt soon to be followed by several more, there now being quite a serious loss in the output there in consequence of the high price of Coke. Prospects in the Iron branch are decidedly gloomy in Germany for the winter months. Production continues in excess of the demand, causing an uninterrupted downward tendency. Thus Spiegel, although the demand is fair, is again ½ mark lower for all but high grade. Puddling Pig is even better sustained than might be supposed under the circumstances, and this also relates to Foundry Pig. Luxembourg Pig is neglected to such a point that it can now be had for less than 40 francs ℔ ton. Finished Iron is in a worse position in Rhenish Westphalia than it was a fortnight ago. And this as much as regards Rods, Special and Sheets. The demand for the latter has now dwindled down to a minimum. Prices for all Finished Iron are very much depressed. Although it is now so very cheap, the rolling mills are losing money on all they turn out. But few rolling sheets are fully booked, and the result is that the rest will have to reduce production. Nor is the position of Thin Sheets any better. The price continues to droop from day to day, and but few mills have orders enough to last them a few weeks. *Metals.*—Trade generally is in such a precarious condition in Germany that it would be a wonder if Metals formed an exception, yet Copper has been looking up.—*Borsenhalle.*

HOLLAND.

ROTTERDAM, October 31, 1885.—*Tin.*—Although the demand for Tin in Holland has slackened considerably of late, prices are tolerably well sustained owing to the reduced available supply. Sales have been made to a moderate extent of Banca at 55.50 guilders ℔ 50 kg., and Billiton has sold from 54.75 down to 54.50. At the latter figure it has also sold deliverable three months from to-day. The Billiton sale at 61.75 ℔ picul is equal to 54.50 guilders ℔ 50 kg. here.—*Koch & Vlierboom.*

SWEDEN.

STOCKHOLM, November 5, 1885.—*Iron.*—During the first nine months of the year Sweden exported only 23,193 tons of Iron Ore, against 37,748 in 1884, and 140,046 tons of Pig and Finished Iron, against 165,349 in 1884; 20,531 tons of Zinc Ore, against 15,635, and 1,467,000 crowns worth of machinery, against 1,752,000 in 1884. The crown equals 28¢ American.—*Dagbladet.*

CONTENTS.

MECHANICAL.

The Unexpected Which Often Happens.*

If we had no experience or knowledge, or no knowledge of the experience of others, everything which happens would be unexpected. It is not so much the unexplainable as the unexpected which attracts our attention, excites our astonishment, or disturbs our mental equilibrium. The man who devotes his life to experimenting with practical mechanics is sure to meet with the unexpected, or else to be too wise for his generation. Some of us do not care to admit that we were ever caught with the unexpected, but I beg to expose a few of the many things that have come upon me unexpectedly, in the belief that they may be of use to others, and in the hope that others will explain their experience, that we may profit in return.

Things perfectly familiar to mechanics engaged in one branch of industry are often matters of great wonder to workers in another branch. Men may work a lifetime in cast iron as applied to tools and machinery, and yet know nothing of what it will do in the heating stove of a blast furnace. To such a man the discovery that cast-iron heating-pipes grow from 6 inches to 1 foot in length by use would be unexpected. To tell the blast-furnace man that certain core-bars used for casting pipes changed their length by 3 inches in casting 20 or 30 pieces would be no surprise until you supplemented the statement with the fact, strange to him, that they grew shorter rather than longer. Another example of a strange fact, well known to plumbers and not to many others, is what is called an "air-trap." What that is can best be explained by an example. A cistern in the roof of a house has a pipe leading from near the bottom, down to the cellar, along the cellar bottom and up to a wash-basin of the ordinary sort. When this cistern has once been filled and then emptied and again filled, air is trapped in the pipe. When the basin-cock is opened the water will not force the air out and be discharged at the outlet, as most mechanics would suppose. You ask the plumber about it, and he will say, "Why; don't you know what that is? That's an 'air-trap.'" You say, "Oh!" and venture to suggest that you should think the water would force the air out. The plumber says, "It is an 'air-trap,' and how can it?" You say, "By gravity." Then he says, "Oh!" and you finally come to the conclusion that possibly he knows just as much about what an "air-trap" is as you know about gravity, and no more. The thing is explainable, of course, but is likely to come upon most men unexpectedly.

The unexpected sometimes comes from causes perfectly self-evident after the thing had happened, as was the case in my experience by the clogging of a nail machine by the scale from the nail plate, and at other times from causes utterly unexplainable, or from causes which are difficult to fathom. In practice we use with a fair degree of success, for a piston-rod packing, simply an easy-fitting Babbitt bushing. When these bushes become worn, so as to leak, we close them up by compressing them in the water cylinder of a sort of hydraulic press. In this operation a mandrel somewhat smaller than the piston-rod is put inside, and with all the pressure we can bring to bear we have never been able to compress the bush so as to grasp the mandrel tight, and yet in two or three cases, perhaps a half-dozen, we have had these bushes (one of them after running a year) shut down while the engine was running, so as to grasp the piston-rod as if gripped in a vise—in fact, so as to break the bushes asunder, or so that we had to resort to destructive measures to get them off. In the formation of embossed work male and female dies are used, and the female dies are often made by driving the hardened male die into a block of soft steel. This operation is easily performed by a few blows of the drop hammer. It drives in and raises the soft metal without distorting the block in any other respect; whereas, if the same operation is attempted by means of the hydraulic press, the block may be upset one-fourth its depth, the sides bulging out or the piece crushed without producing any impression of the male die further than a slight line marking of it.

The unexpected comes upon us both by things not working when we think they ought, and by their working when common reasoning would indicate that they ought not. The man who first invented or constructed a lawn mower must have been thought an idiot (or at least a man not familiar with the common laws of mechanics) to have imagined that he could with two light wheels get traction enough to rotate a cylinder six times their own weight, at six times their own velocity, and cut the grass in addition. The worm that drives the bed of a Sellers' planer does not wear out half as fast as it ought, and I fancy there is something unexpected about it, even to the makers themselves. An engine with a 12 x 18 inch cylinder had been running a year at 185 revolutions per minute, standing usually quiet on a cut-stone foundation. One day, without any apparent cause, it began to shake endwise, and before night had shaken itself loose and had a movement of $\frac{3}{16}$ inch at every turn. The engine being self-contained, no harm came to it except the loosening of the foundation, and as the work was of more consequence than the foundation it was allowed to go on with a view to repairing it at vacation time, a month ahead. Before vacation time came, the shaking stopped without any more apparent cause for its stopping than that which caused it to shake, and the engine continues to run perfectly quiet, notwithstanding the shattered foundation.

One of our well-known electricians built and tested for three years a certain piece of apparatus which promised to be of extensive application. It worked perfectly, and was as good at the end as at the beginning. A large amount of capital was put into buildings and plant for the production of these pieces of apparatus for the market, and a good many were built, but in no possible way that all hands could devise were they able to reproduce the original, either in effect or durability. I make this statement at second hand, but believe it to be true, first, because of the source from which it came, and, second, because it seems the only explanation reconcilable with the action and business character of the parties interested. The unexpected often happens to the scientist as well as the practical man, as must have been the case with Crooks when he invented the radiomotor. The story goes that he first invented the thing and then made it; but it turned out as tradition says the ship did, when some genius blew into the sails with a bellows—it went the other way. We laugh at the stupidity of the man with the bellows; the next generation may laugh at Crooks. I venture the guess that there is many a man of science who, knowing nothing of the rolling of railroad rails, if asked to dictate as to which way the rail should be bent to have it come straight when cold, would find that the unexpected would be likely to have happened twice when he saw his plan put in practice. The case is reported to me where the unexpected happened to two boilers, and they did not blow up, either. Two boilers alike in size and shape were connected by necks of considerable area, both at the top and bottom, and the connections, both of steam and water, were without check-valves. A fire was built under each of the boilers, which were both half-full of water, and when steam was raised to working pressure the generators began to play shuttlecock with the water. It first went all into one boiler, and then all into the other. When the play got to its hight, the boss, considering the premises and the lives of the men of more consequence than the cause of science, ordered the fires drawn, and the cause or consequences were never settled. In the case of an engine which was more than twice too large for the work it had to do, and which could not be reduced to one-half the speed conveniently, it was decided to bush the cylinder to about half its area, with a view, of course, to the saving of coal. The result was that it took a little more coal than before. I think that this result was one which would have been unexpected to most men who did not know of the experiment having been tried before.

For casting a chilled die to be used under a drop hammer, old chilled car-wheels were used, and in which 14 per cent. of spiegeleisen was melted under the expectation that a good chill would be produced, as had been our experience. The first surprise was to find that the die showed no evidence of chill whatever, and could be filed easily. Some pieces of work were required at once, and the die was put in with the expectation that it would only serve for a few, but the second surprise came when its endurance proved to exceed the best of the chilled dies as two to one. A large percentage of the unexpected comes in the development of original inventions. When in the experimental stages it is easy to brand the inventors fools or lunatics, and when predicted failures succeed it is easy to forget that we ever expected anything else. It is not always the ignorant who are wrong, or the best informed who are never in error. If 10 years ago the possibility of conversing with people 50 miles away had been publicly suggested it would have been only accepted by the ignorant, who, remembering the marvels that have been accomplished, would in their blind faith admit of its possibility, while the best informed would have been staggered at the suggestion. Less than 10 years have rolled away, and it is an every-day occurrence.

It is not always the uneducated, the insane or the stupid who produce failures, nor the best educated, most thoughtful or most experienced who bring out everything according to the original intention. The unexpected comes to the good and bad alike, and so in our teachings to the young and our planning for ourselves is it not well to have our statements and our speculations pretty well saturated with the elements of uncertainty? It is an old and common custom to use the statement that "two and two are four" as an example of the certainty of certainties, and another that "like causes produce like effects;" while as a simple matter of statement the first can be easily shown to be 25 per cent. off, and the latter to hold along all the way from like results to results diametrically opposite.

* By John E. Sweet. Read at the Boston meeting of the American Society of Mechanical Engineers, November 10-13, 1885.

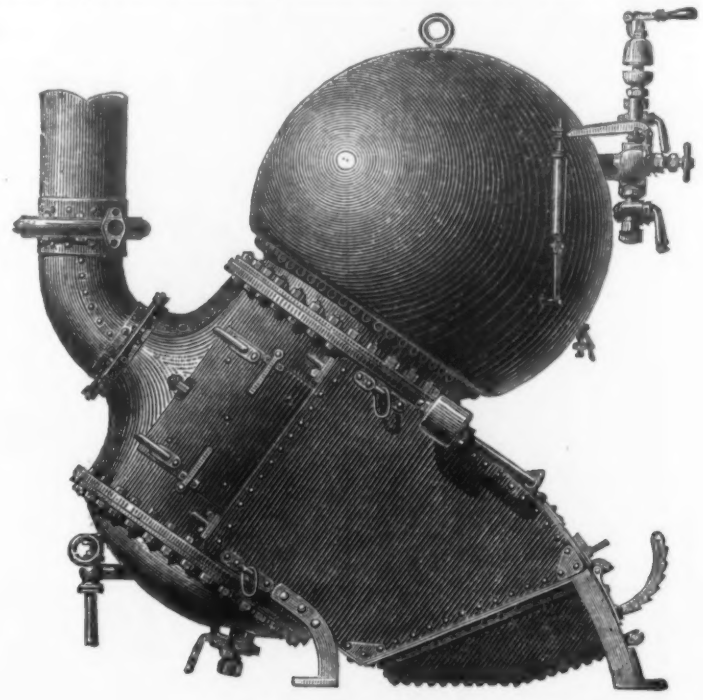


Fig. 1.—Side Elevation.

CADIAT'S MARINE BOILER.

Cadiat's Marine Boiler.

A novel form of boiler specially designed for marine purposes is being built by a French firm, Messrs. E. Mourraille & Co., of Paris. It is the invention of M. V. Cadiat, and is claimed to possess in a marked degree all those features desirable in boilers of that class, such as great power within small space, light weight, ease of access for repairs and inspection, large evaporative power, and durability.

The annexed engravings from the *Revue Industrielle* fully explain its arrangement.

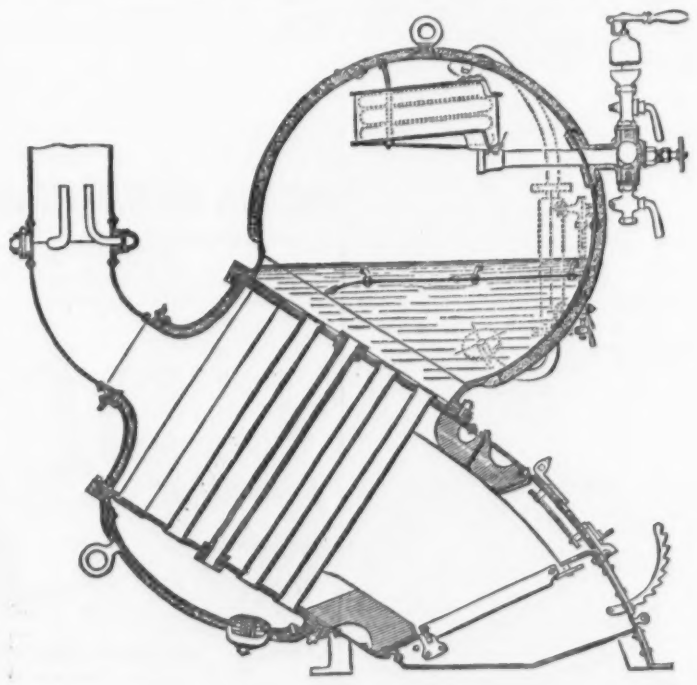


Fig. 2.—Longitudinal Section.

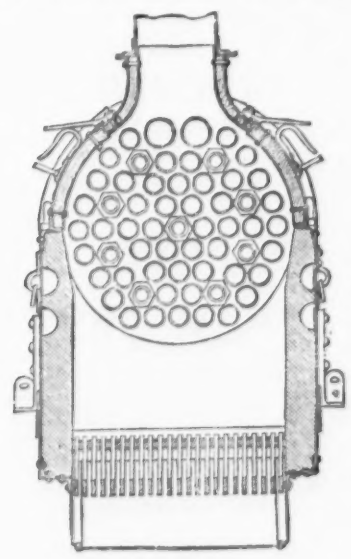


Fig. 3.—Cross-Section.

The water-tubes are of brass, and are inclined at an angle of 45°. They are fixed between two circular plates, and in order to insure stiffness nine special tubes are introduced, screwed into the tube-plates and secured at the ends by nuts. The tube-plates themselves are made somewhat thicker at their peripheries than at other points, with the view of imparting greater strength, and these flanges, as they may be called, are turned, so as to insure good joints. The upper tube-plate is riveted to a spherical dome partly filled with water and steam, and the lower one is furnished with a suitable cap. Two of the tubes, those furthest from the grate, have relatively larger diameters than the others, to facilitate circulation, which at that point is less active because of lower temperature.

The spherical dome carries the usual safety appliances. With the exception of the water-glass, all the other attachments, such as whistle, pressure-gauge, steam-supply pipe, &c., are placed on a special box connected with a steam drying apparatus placed in the spherical dome. This drying apparatus consists of a coiled pipe having a number of small holes, each of which is furnished with a thin inclined plate. Rushing through these openings the steam is freed from any water mechanically suspended. The water thus separated is led back to the boiler. The latter is carefully covered to guard against excessive radiation of heat, and in such a manner as to present little difficulty in case removal of the covering should become desirable. The spherical dome and the lower cap are covered with felt, which, in turn, is covered with a brass jacket. Blast-pipes are led into the chimney, as shown in the section (Fig. 2). Conclusive trials were made with a boiler of this type at the Toulon Arsenal. From these interesting figures were obtained, showing, among other things, an evaporative power of about 7½ pounds of water per pound of fuel, the latter being in the form of Anzin briquettes. Handling the fire and cleaning the flues are easily accomplished.

An Electric Road-Roller.

Bearing upon the subject of practical applications of electricity as a source of motive-power, of which a number of successful examples have lately been recorded, it is interesting to note that about two years ago dynamo electric power was applied in France to drive a road-roller. The experiment, we believe, was made in Paris, the electric machinery being adapted to the framing and roller of an existing steam roller, from which the boiler and machinery were removed leaving a platform about 18 feet long and 6½ feet wide. This was carried on cast-iron rollers 4 feet and 4½ feet in diameter, weighing in all from 10 to 11 tons. On this platform 104 Faure accumulators, weighing about 130 pounds each, were deposited, making a total load of about 6 tons. The dynamos and machinery weighed about 1 ton. Together, the gross weight of the roller amounted to 18 tons. Steam cylinders of this weight were found to work to from 10 to 15 horse-power, and to more on an emergency, and for this power two Siemens dynamos on one shaft were provided, capable of exerting about 12 horse-power, and more by increasing the velocity. A small dynamo of 1¼ horse-power was supplied for steering. The motion of the dynamos was reduced and transmitted by suitable gearing to the intermediate shaft, whence it was transmitted in the usual manner to the rollers. The accumulators had each a power of about 2 volts, making together about 200 volts. Seventeen accumulators were reserved for the steering when it was necessary. Those remaining were employed more or less for locomotion. On firm ground 50 accumulators sufficed for this purpose, with an intensity of current of from 30 to 40 ampères, representing from 4 to 5 horse-power. The speed attained did not exceed 1¼ miles per hour. The roller was taken over some newly-laid macadam from 8 to 10 inches thick, bedded on a clay substructure on an incline of from 1 in 50 to 1 in 33. All the accumulators were brought into action. The rolling commenced at a speed of from 2 to 2½ miles per hour, and was continued for three hours with as much facility as if the machine had been worked by steam. The expenditure of electricity was proportional to the resistance of the ground. The intensity of the current averaged 35 ampères, and reached at one point 75 ampères, which for 104 accumulators corresponded to 20 horse-power.

Some Reflections on Cheap Iron in the South.

The following estimates were lately sent from Birmingham, Ala., to a paper in one of the Western cities:

The cost of making pig iron in Alabama, according to figures given by a daily paper published here (Birmingham), is shown below, and it may agitate the minds of some iron producers who cannot possibly manufacture it at a less cost than $13 or thereabouts:

Two and one-half tons of ore at $1.15	$2.88
One ton limestone	.70
One and seven-tenths tons of coke at $2.30	3.91
Labor and salaries	2.25
Incidentals and depreciation of plant	1.00
Cost of a ton of pig iron	$10.44

During a late visit to Birmingham I showed this publication to a prominent iron manufacturer. He said that there was no note taken of taxes, of interest on working capital, nor of loss in weight, and that fully $1 more should be added for "incidentals and depreciation of plant." He stated that the very best he could calculate was to bring it down to $11.70. There was no provision for accidents; one of the Birmingham furnaces had during the year an accident which it cost $10,000 to repair. That furnace very properly charged it to cost of iron, but another furnace owner stated that he would have charged it to "profit and loss." By such bookkeeping the cost of iron was made low, yet just such accidents are liable to occur every year.

Assuming the latter manufacturers' figures to be correct, and they are low enough when scaffolds and bad working are taken into account, then we have for the pig iron $11.70. The freight to Louisville is $2.50; to Cincinnati $2.75—making the cost of the iron in the latter place $14.40; hence if the furnace owner in Cincinnati can make his pig at $14.40 he is on equally as good ground as the furnace owner in Birmingham, and has the same opportunity for profit. But it remains a great matter of doubt whether any of the furnaces in or around Birmingham make their pig with 2¼ tons of ore; in fact, it is a certainty that as an average they do not, but we have taken for reference the higher figures.

This point of prime cost in the furnace yard and the freight to be added has in it much cause for thought and argument. The freight on pig to Terre Haute, Boston, New York, Philadelphia and other points is $3.75 per ton. This added to $11.70 makes $15.45 as the actual cost of Birmingham iron to the large number of manufacturers to whom the furnace owner desires to sell his products. What good would it be to Alabama if her furnace owners could make iron at $5 per ton, if it cost them $10 to get it to any one who wanted it.

The plain, simple fact is that the cheaply-made pig iron of Birmingham, or any other point in Alabama or the South, is of very little value to the State or section until articles of general consumption are made from it at or near the furnaces which produce the raw material. There are in the immediate limits of Birmingham five furnace stacks, yet probably nine-tenths of the castings used about them were made in Pittsburgh or some other Northern city. I saw a new bell and water-pipe at one of the foundries, but no doubt the first used in that furnace was made at the North, and probably many following. Hundreds of steam engines and boilers are sold every year in the Southern States, and many of them are erected in sight or hearing of the furnaces in which the crude pig in them was produced.

That Birmingham and other points in Alabama and the South possess wonderful advantages for the manufacture of pig iron at a very low cost is certain, but of what advantage is the continued and increasing production of that raw material at this low cost when to put it where it can be sold and used a tax called freight is absolutely necessary? The producer of any raw material is seldom the receiver of large profits. It is the man who takes an article worth 1 cent or less per pound and puts it into another article which sells for 5 or 10 cents per pound who makes the great profit and amasses wealth.

The need of Alabama and the South, then, is such an increase of her manufactures that the conversion of the raw material into the various implements, machines and articles of agriculture, manufacture and commerce will consume at home a large part of that raw material. The present system of multiplying blast furnaces without increasing the consumption of pig iron in their immediate neighborhood is simply a constant transfusion of blood which can only end in waste and decay to the one who supplies the life-giving fluid to the strengthening of the other.

At the same time there is a point to be considered in the discussion of this subject. It is proven unquestionably that the maker of pig iron at well-located points in the South can produce his raw material and sell it in the North at such rates that it becomes the advantage of the Northern manufacturer to use it. Hence it is another advantage in favor of the Northern maker of varied articles to control a certain supply of such raw material as may be best adapted to his uses. Therefore it becomes further his interest to erect furnaces and manufacture the raw material necessary for his manufactures. He gets the primary selection of just what he wants. And with this view it is the interest of the Northern manufacturer to own interests in and multiply blast furnaces in the South. The less cost of his raw material the greater profit on his manufactured product. This view is perhaps a matter of regret, for it is likely to be soon seen by the ever live manufacturer of the North, and to be quickly utilized by him. I saw in Birmingham a number of carloads of pig iron going to Allentown, Pa. If it pays, the manufacturer there to buy that iron, and he finds that it is best adapted to his use, he will not be long in finding a location where he can make it for himself.

While in the commencement of this article it has been argued that iron is not made in Birmingham as cheaply as some have stated, it is known that there are great possibilities of improvement in cost and average quality, and nothing so tends to develop means of cheapening a product, as well as of improving its quality, as the necessity for economy and the long continued existence of low prices. No one can to-day visit Birmingham or any of the Southern furnaces without being convinced that efforts are steadily being made to these ends, and that, as usual, constant effort will succeed in accomplishing the end sought for. H. E. C.

We have heretofore made some reference to Mr. Secor's experimental yacht Eureka, which will be propelled by a series of gas explosions from apertures below the water-line fore and aft. The inventor is John A. Secor, son of Samuel Secor, of the Secor Iron Works, whose father is said to have made the machinery for the Robert Fulton. The expectation is to run the Eureka at about 8 knots, with 40 explosions a minute. Her machinery occupies a very small space, consisting of a dynamo engine, the fuel used being petroleum. Mr. Secor says: "We can have any number of explosions, from one to 80 per minute, so that the speed of the boat can be regulated at will. The power can be instantly reversed—that is, the gas can be forced out of the holes leading aft to send the boat ahead, and out of of those leading forward to stop her or give her sternway. If she succeeds she will revolutionize the whole system of water carriage. I expect that we will be able to go from this city to Newport with this boat at an expenditure for fuel of only $1."

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CLIMAX ROLLER SKATES

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The post and socket or vertical motion provided with a tension gives them the most scientific movement (pronounced so by leading experts) of any Skate heretofore offered to the public.

For beauty, cleanliness, simplicity, durability, symmetry and light running it rivals all competitors, and stands, as its name implies, the "CLIMAX" of all Roller Skates.

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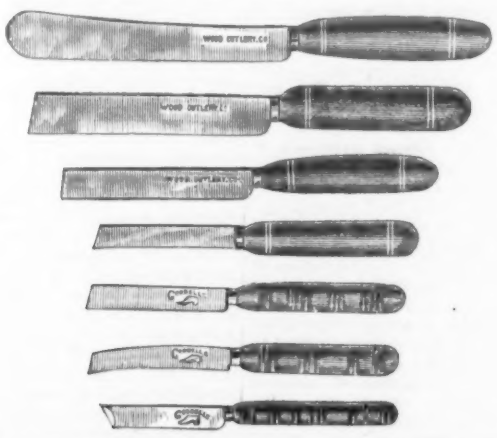

are made from the *Best Cast Steel*, hardened and tempered by skilled workmen, and can be relied upon for possessing *Superior Cutting Qualities.*

We make the largest and most complete line of Shoe Knives ever offered to the Trade, including every description and style, and our prices are no higher than is asked for goods of inferior quality.

We make three grades, viz: *"S. TUBB'S," "WOOD'S," and "GOODELL'S BEST."*

Especial attention is given to the temper of these knives, and all are really *"KEEN KUTTERS,"* and warranted to give satisfac ion.

We also make a complete line of Table, Butcher, Sticking, Skinning, Steak, Cigar, Putty and other knives, including *CARVERS.* Illustrated Catalogue sent if applied for.

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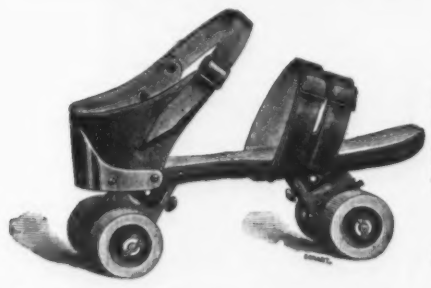

"HARVARD,"

BEST IN THE WORLD.

Made of the very best materials; simple in construction; light and neat in appearance; noiseless in movement; easy to keep in order; finished in thorough and workmanlike manner; warranted to possess all the qualities and requirements necessary for any and all purposes where ROLLER SKATES ARE USED. **Rubber Cushion held in Patent Adjustable Box; can be raised or lowered at pleasure to take up all wear.**

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J. E. EVANS

Anti-Friction SKATE.

Perfected on the ball-bearing principle. In general use by experts and fancy skaters, who pronounce it the *Best, Easiest Running* and cleanest Skate made. It is perfect in adjustability to suit beginner or expert, and is *Self-Lubricating.*

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The "BOSS" Trap.

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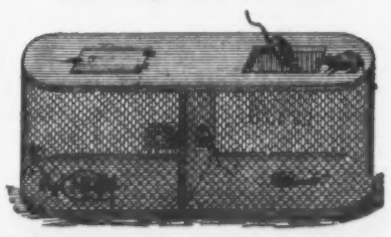

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MANUFACTURERS OF

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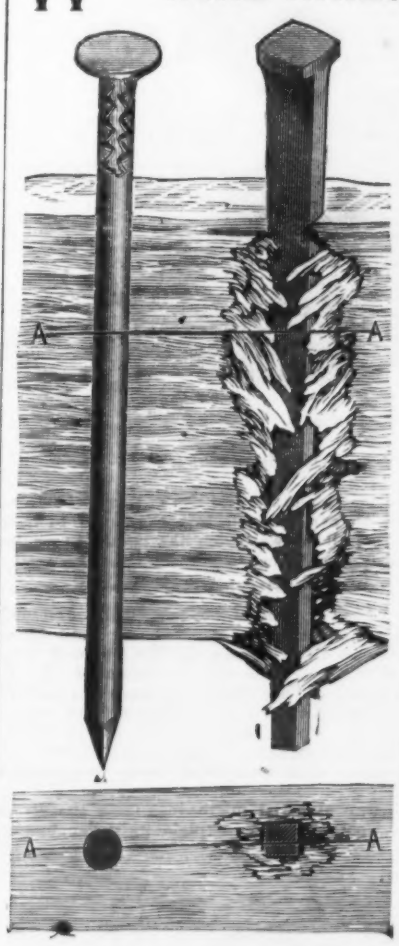

The above cut represents the effect on wood of a Cut Nail and a round, pointed Steel Wire Nail.

NOTICE.

The Salem Wire Nail Co. will be ready to book orders for prompt delivery on December 15, 1885. Correspondence solicited.

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Has no equal for screen and other light doors. Made of the best Crucible Steel Wire.

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Wrought Iron. Anti-Friction.

IT EXCELS ALL OTHERS IN

Security of Door.
Strength of Material.
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THIS HANGER

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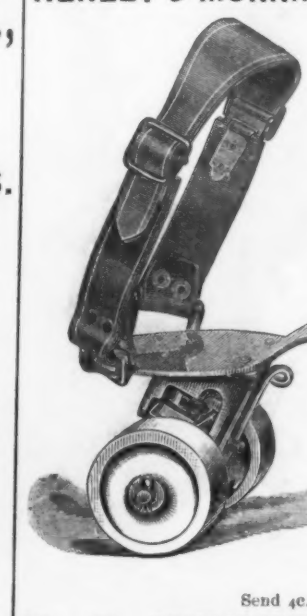

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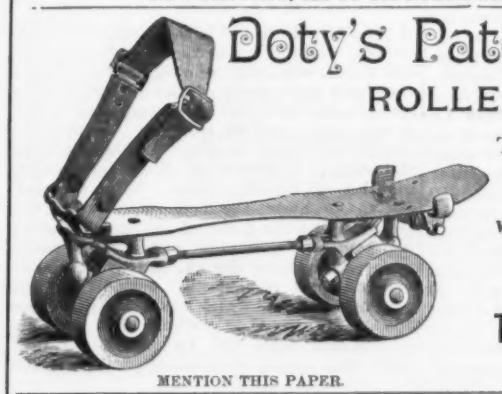

THE LATEST AND BEST.

It is Light, Handsome, Durable and Complete.

WE INVITE COMPETITIVE TRIAL WITH ANY SKATE IN THE MARKET.

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The American Roller Skate

Latest and Best, Entire New Action, Light, Durable. Guaranteed to Give Entire Satisfaction.

The only Skate in the market having a perfect double action without any wear on the rubber cushions. We also manufacture the only Rink Skate having an adjustable toe clamp. Address for descriptive circular

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Hardware and Stove Dealers should send for Circular of our New Adjustable Back Wall for Cook Stoves.

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A trial will convince any one of its superiority.

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Perfect Action. Handsome Finish. The lightest running Skate in the Market.

The **Miller Champion Roller Skate**, manufactured by the **James P. Smyers Roller Skate Co Hamilton, Ohio.** The *only successful Steel Coil Spring Skate* in existence. A great saving to Rink Managers. The most Scientific Skate. The Miller "S" Skate, Malleable Bottom, sent to any address on receipt of **$4.00.**

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RIPLEY MANUFACTURING CO.,

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BEST PORCELAIN-LINED LEMON SQUEEZERS

"COMMON SENSE" MOUSE TRAPS, MALLETS BOOT JACKS, ROSEWOOD FAUCETS, &c. Fine Wood Turning a Specialty.

METALLURGICAL.

Composite Iron and Steel.

English newspapers call attention to what is claimed to be a new combination of iron and steel manufactured by the New British Iron Co., at their Corngreaves Works. The *Ironmonger*, after referring to the advantages and drawbacks, both of iron and steel, says:

Having regard to the foregoing consideration, the question naturally suggests itself as to whether a combination of iron and steel in alternate layers does not possess many advantages over a piece of homogeneous steel for at least a very great variety of purposes. In some instances where these advantages have been recognized it has been attempted to accomplish them by piling iron and steel and welding them together under a hammer, after the ordinary method of making iron forgings. From the nature of the operation this has, however, proved more or less unreliable, only steel of special quality being available, and it is said it is not to be compared with the method the New British Iron Co. adopt of placing rolled iron bars in a mold parallel to each other, and to the axis of the mold, and afterward pouring around them steel of any quality or grade of hardness desired, the ingot being afterward rolled down as a whole into any desired section or size. This composite steel and iron being essentially a non-homogeneous material maintains all the advantages of iron, whether in plates or bars, with the extra strength and ductility of steel. It welds with perfect freedom, and there is little difficulty in insuring that the weld shall be of the same strength as the solid portion of the material, which is a most difficult thing to attain in treating steel. It consists of a series of rolled iron bars placed in the ingot mold, into which steel is afterward run; the ingot is then rolled down either into bars or plates, with the result that the interior consists of highly fibrous iron alternated with steel, all soundly welded together, while the exterior shows an unbroken thickness of steel. The proportions of iron to steel may be varied to suit different purposes, but in general it may be taken that the iron is from a fourth to half of the whole mass. When the material is laid together for welding, the alternate layers of iron very materially assist in producing a perfectly sound weld. For such purposes as boiler-flues, cross-tubes, chains, &c., the advantages of this are most marked. For axles the material is most valuable, since any cracking which may occur on the surface, and which is by no means unusual in ordinary steel railway axles, will only pass through, in the first instance, the outer thickness of steel, being stopped by the bundles of fibrous wrought iron, which take up the strains for the time being and thus afford timely opportunity to notice any defect, and probably to prevent the sudden and often disastrous failure which would be likely to arise from the use of a homogeneous steel axle, liable to sudden fracture. For piston-rods of steam hammers, bolts for fixing armor-plates and other pieces subject to sudden shocks and strains, the immense advantages of such a material are obvious. The results of the tensile tests of the composite plates give an average of 22 per cent. higher strain than the Admiralty requirements for Best Best plates along the grain, and 38 per cent. more across the grain, while the angle through which the test pieces from the composite plates will bend hot or cold is greatly superior to the Admiralty requirements, and, practically, equal to steel. This shows that for boiler-plates and similar purposes this material has eminent qualifications. It may be added that the company are at present manufacturing steel ship-plates, and have made deliveries to shipbuilders in the South of England.

American iron manufacturers will recognize in this new English product an old friend, which, so far as we know, has not achieved a startling success after many years of trial.

Large Output of Bessemer Steel.

Mr. W. H. Greenwood, Sheffield Technical School, states that he has received a communication from the United States giving the following record of the output for the week ending 4 p. m., Saturday, September 26, 1885, of a pair of 7-ton Bessemer converters:

Monday	75	blows, producing	545 tons.
Tuesday	103	" "	755 "
Wednesday	96	" "	691 "
Thursday	102	" "	743 "
Friday	92	" "	661 "
Saturday	84	" "	610 "
Total	551	blows, making	4,005 tons.

This is, he believes, the largest make for one week that has yet been recorded, even in America, and is very greatly in excess of the output from any English plant of the same nominal capacity.

Plant and Processes.

C. M. Pielsticker, of London, England, and F. C. G. Müller, of Brandenburg, Germany, are the patentees of an apparatus for the continuous production of rods or wire direct from the molten metal. The apparatus consists of a drum mounted on a horizontal axis and rotating in bearings formed in upright supports. The drum is made hollow in order to cool its periphery, cold water entering at one end of the axis, while the heated water escapes at the other end. In the middle of the face of the drum, and around its entire circumference, runs a groove of such section as the rod to be cast is to have. The edge of the drum is beveled, and its face is inclosed by a semicircular segment. The segment is also made hollow in order to keep the concave surface cool, cold water entering at one end and being discharged at the opposite end. A groove in the segment is placed opposite to the groove on the drum and is filled with a refractory material. The rods issue at a tangent to the circumference of the drum, which obviates any strain or twist in the still soft metal.

Brown & Co., of Cleveland, Ohio, have patented a process of dressing rolls such as are used in rolling mills for the manufacture of metal plates and sheets. By this invention the rolls may be dressed without removing them from their housings or putting them into a lathe. The rolls are revolved together under pressure while they are placed oblique to each other. To this effect one of the rolls is hung in boxes that may be moved sideways in their supporting blocks. With the old custom of bodily removing the rolls the trouble and delay were so great that the rolls were used even when already in a bad condition. By the new process the rolls may be dressed a little from time to time, say at noon, morning or evening, and may thus be always kept in good condition.

A spike blank introduced by W. Koplin, of Youngstown, Ohio, is designed to produce spikes particularly strong at the junction between head and shank. The blank is rolled from iron or steel, and is entirely flat on one side, while its other side has a tapering edge, a straight top and a bulged portion beneath said top. The upper straight portion of the blank contains sufficient material to form the head, while the bulged portion forms a fillet at the junction of the head and shank. Thus the spike is thickened up at the part which is subjected to the greatest strain, and which in the spikes now in use and having upset heads is the weakest point. The blank is cut into narrow sections by a a series of transverse cuts, and each section is introduced into the heading machine to form the head, fillet and point.

A new mode of forming the cutting edge on an axe has been brought out by H. Hammond, of New Haven, Conn. In place of upsetting the edge by a hammer, it is sheared off on the desired line by any suitable shearing mechanism. The shearing operation leaves the metal in a state of uniform density and undisturbed crystallization, while the upsetting operation is said to leave the metal in a state of variant density and broken crystallization. This variant density results from the varying number and force of the blows. The claim of the patent obtained for this invention covers the process of forming the edge of the axe blade, preparatory to grinding, by shearing off the blade on the line of the proposed edge.

A blast furnace the hopper of which is supplied with a cooling medium has been patented by P. L. Weimer and H. T. Easton, of Lebanon, Pa. The hopper, lip ring, charging bell and the seat ring are provided with air-chambers formed in the walls of the castings. The air is supplied by pipes leading to the several parts. After passing through the chambers the air is discharged through openings protected by hoods from the falling stock. The pipe that supplies the air to the bell has a joint to permit the bell to be raised and lowered. The supply may be induced by the natural draft of the chimney or it may be supplied by a pump. Instead of conducting the air through the hollow castings, the discharge openings may be omitted and water supplied through one of the pipes, and conducted outside of the furnace through the other pipe with which each cooling chamber is provided. A ventilating chamber surmounts the hopper and supplies fresh air to the upper part of the tunnel-head constituting the charging chamber, and at the same time carries off the air which has circulated through the hopper and charging chamber.

F. T. Smith, of Plantsville, Conn., has patented dies for forging blacksmiths' tongs, by means of which the tongs can be produced complete at a single heat. Two dies are employed containing a number of passes or forming surfaces which shape the tongs from a rectangular bar. The first operation is to break down the bar at the junction of the jaw and tail, and then the jaw end is flattened and a shoulder is formed, after which the tail of the jaw is drawn to the desired width and thickness. The blank is then bent to the required form, and is finally given its normal shape in a finishing die. Provision is made for the escape of surplus metal, which is subsequently trimmed in the usual manner of trimming the fin from forgings.

Gordon Strobel & Laureau, of Philadelphia, Pa., are the patentees of a blast furnace the bell and hopper of which are cooled by internal air currents. Annular conduits cast into the lower rim of the bell and hopper communicate with the outer air and with the chimney. The chimney maintains an upward draft and causes a constant inflow of cool air that circulates in the conduits and thence passes out to the chimney. Thus the joint seat of the bell against the hopper is kept properly cooled. Within the bosh wall of the furnace are disposed a number of flat segmental plates which are provided with cavities having two air openings, one of which admits the air, while the other is connected to the chimney, so that the draft of the latter will produce the proper circulation.

E. Phillips and T. Jones, of Pulaski, Va., are the patentees of a process of preparing the charge for spelter furnaces. In the ordinary process of shoveling the charge into the retorts a large quantity of the ore goes to waste. To avoid this the inventors proceed as follows: The charge, consisting of ore, flux, skimmings and dross, is mixed with lime, flour or a similar binding agent. It is then compressed into a solid mass or cylindrical cartridge having a central longitudinal opening or flue. The cartridge is made slightly smaller than the retort, so as to be readily introduced into the same. On being subjected to heat the flue permits its circulation, so that the charge is more speedily and completely reduced. The cartridges may be prepared in a separate building from the furnace, and may be conveyed thereto in cars or in other suitable manner.

A machine for making seamless tubes, columns, boiler shells, flues and other hollow cyndrical articles from hollow ingots, piles and billets of iron and other metal has been patented by C. Kellogg, of Buffalo, N. Y. The hollow ingot, pile or billet is placed over a grooved circular head and the rolls, and is moved back until its forward end just covers the furnace. Gas is admitted to the furnace and is ignited, whereupon the intense heat generated heats the part of the ingot around the heat chamber. When the ingot is raised to the proper temperature for rolling it is passed into the nip of the rolls, which are put in operation. The exterior rolls and swage-blocks bear against the external surface of the billet and sustain the same on every side in the line of the nip, while the revolving internal rolls operate upon the internal surface, rolling the same true and reducing the wall of the tube to the required thickness. The internal rolls are revolved at a much higher speed than the external rolls, say about 40 revolutions to one, in order to reduce the ingot thoroughly and without choking, and also to expose the walls of the ingot to the heat for a sufficient time.

The Agnew Shafting Co., of Chicago, Ill., have procured a patent for a machine for drawing metal rods or bars. The machine is designed to draw shafts not only of uniform diameter, but also perfectly straight, so that additional machinery for the purpose of straightening the shaft after drawing may be dispensed with. The invention proceeds on the assumption that if the rod is properly guided to and from the die, if the die is of proper construction, and if the drawing strain is applied and continued accurately in the prolonged axis of the die, the drawn rod will be straight. To these ends provision is made in the machine for supporting the die in fixed relation to the drawing mechanism, for giving the gripping jaws of the drawing devices a movement accurately in line with the prolonged axis of the die, and for sustaining the drawn part of the shaft in a straight line against the action of gravity. The die is preferably of such length as to insure against lateral effects or deflections that might otherwise arise from unequally dense places in the surface of the rod.

A New School of Metallurgy.

In an address delivered recently by Prof. W. Chandler Roberts, of the London School of Mines, on the occasion of the opening of the new School of Metallurgy of the Birmingham and Midland Institute, that gentleman said:

In estimating the advantage of special technical instruction in metallurgy it is necessary to bear in mind the two characteristic features of the art of extracting metals from their ores and fitting them for industrial use. First, the history of metallurgy abounds with instances showing that an apparently trifling improvement in an operation, or, it may be, in the composition of an alloy, has been followed by large pecuniary gain, the amount of which would seem to be out of all proportion to the scientific merit of the discovery which led to the change. A suggestion gathered in the laboratory may prove a source of wealth when developed in the works, and it will be the special duty of the teachers who will so soon attack the comprehensive syllabus of the practical classes to indicate the direction in which improvements may be made, and to suggest the nature of the changes to be introduced into practice. The second prominent feature of metallurgy to which I would allude is the enormous influence exerted on a large mass of metal by a trace of another metal or metalloid—that is, by a quantity so small that it appears to be out of all proportion to the mass in which it is distributed. I might adduce instance after instance in support of this point, but it is unnecessary to do so. Workers in the precious metals well know how small a trace of impurity will render gold alloys brittle, and, conversely, it is equally well known that the addition of a very small amount of certain metals to nickel will convert a very brittle mass into a perfectly malleable and ductile one. Electro-platers are familiar with the consequences which may result from a slight change in the composition of a depositing bath. Or, to turn to less familiar points, I think you would be surprised if it were possible to show you some experiments I have recently made on the effect of the tenacity of certain alloys when the surface tension of wires into which the alloys were drawn is released by touching the wires with a mild pickling solution. Consider, again, what a large proportion of the vast field presented by metallic alloys remains entirely unexplored, and how substantial the rewards of discovery in this direction are.

The Future of Canada.

The controlling influence which the Canadian Pacific Railway is expected to have in molding the destinies of the Dominion is thus stated in the Montreal *Herald:*

The Canadian Pacific is the shortest and best line for the transportation of the products of a considerable portion of the traffic originating in United States territory on the Pacific Coast destined for the Eastern States, and *vice versa*. Through its branches and connections it will render similar service for the United States Northwest, through much of the territory lying between Chicago and the cattle ranges of Montana. Hence the necessity for independent connection with the Atlantic ports of the United States and a bridge of its own over the St. Lawrence, at Lachine. By means of this important work it will have independent connection with the railway systems extending to the Canadian winter ports, and with Boston, New York, &c.; and with so complete a system we may safely count upon the great railway enjoying a volume of profitable traffic which will dissipate the fears even of pessimists of the road ever becoming a burden on the Treasury of Canada. Given these Eastern connections perfected—and we have no doubt that they will be within a year; a line of steamships running to Japan, China, New Zealand, &c., and this is as good as settled; the tide of British emigration directed into the Northwest, as it bids fair to be—the future of the railway, and, joined with it, the future of Canada, of which the railway will be the backbone, may be regarded as assured. Not because a pair of rails have been laid to the Pacific, but because of the stimulus which will be imparted to every department of trade and industry, because of the internal improvements which must follow the completion of the work, because of the new industries and new fields for old industries that will be created, and because of the great additions which the railway will make through these channels to the population, the wealth and enterprises of the people.

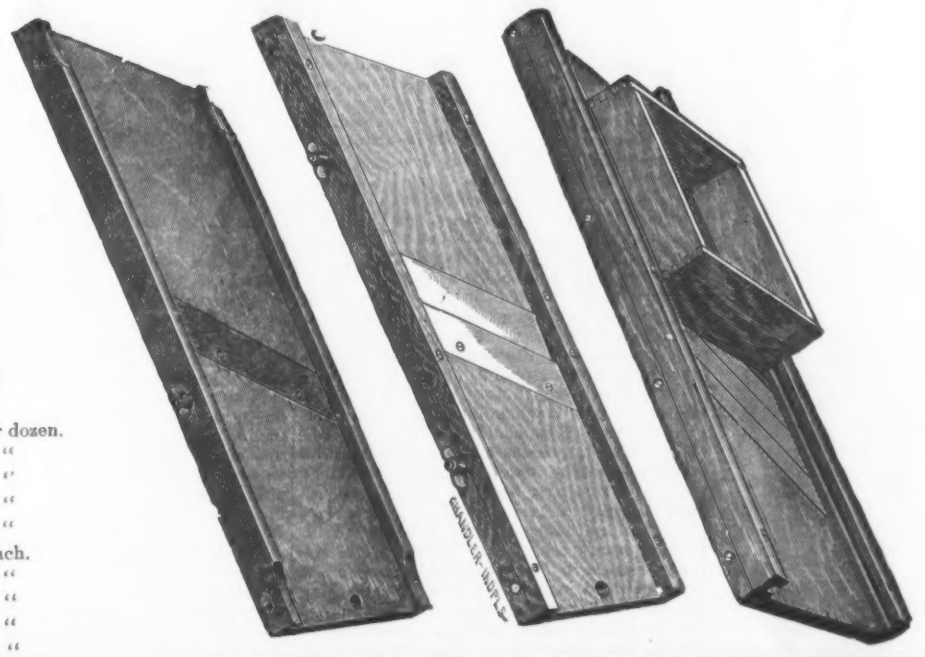
The depression which has existed for some time in the shipbuilding trade of the Clyde is increasing in severity.

TUCKER & DORSEY MFG. CO.,

INDIANAPOLIS, INDIANA.

KRAUT CUTTERS.

No 1	1 knife,	with box,	8 x 26,	per dozen.
" 2	2 knives,	"	"	"
" 3	3 "	"	"	"
" 4	4 "	"	"	"
" 5	3 "	"	9 x 30,	"
" 6	2 "	"	12 x 36	each.
" 7	3 "	"	"	"
" 8	4 "	"	"	"
" 9	3 "	"	12 x 40,	"
" 10	4 "	"	"	"



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Tucker's Alarm Tills, Steak Mauls,

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ALAN WOOD & CO.'S

PATENT LEVEL GALVANIZED SHEET IRON,

And Have No Other.

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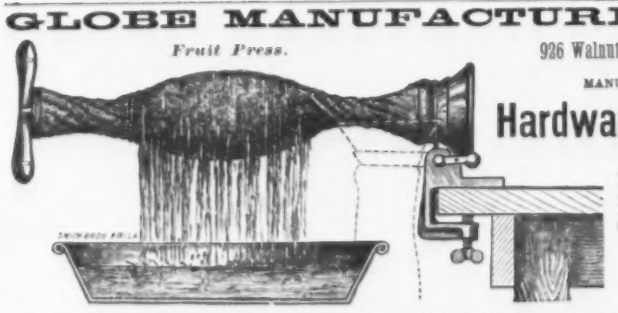

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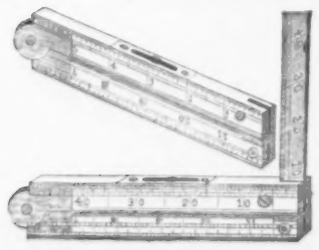

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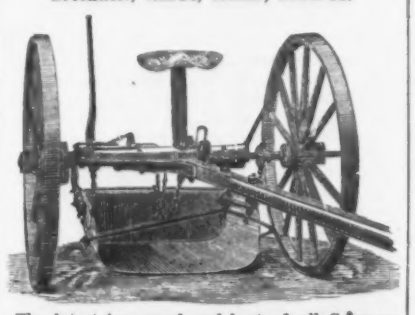

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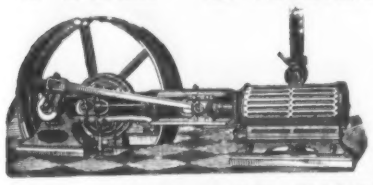

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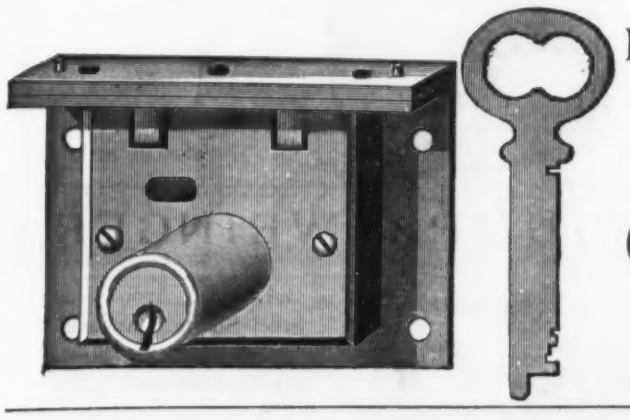

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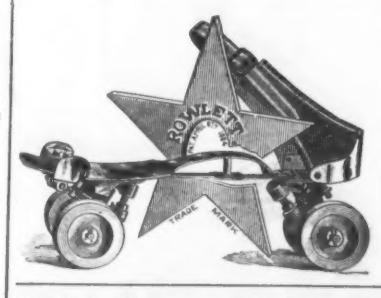

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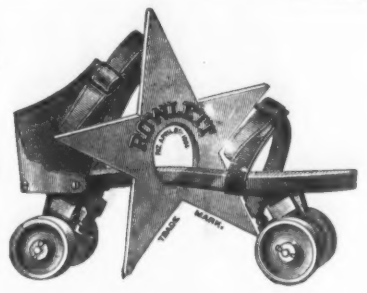

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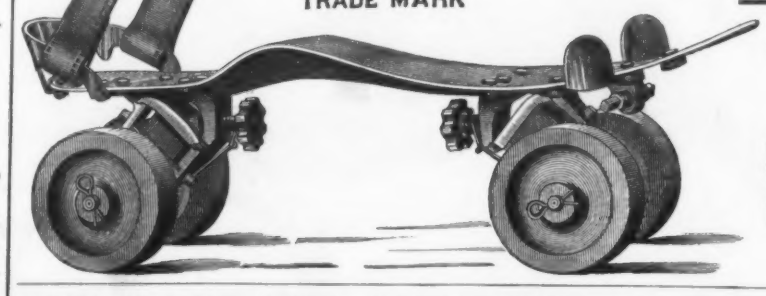

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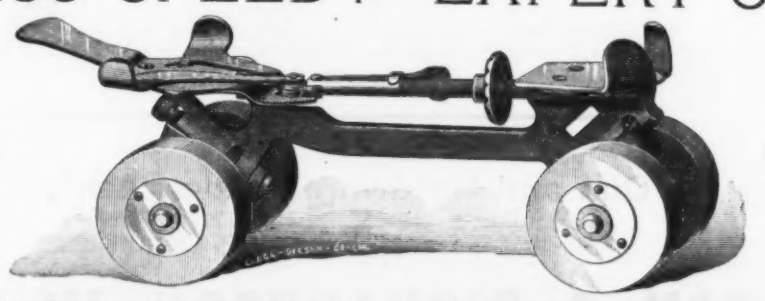

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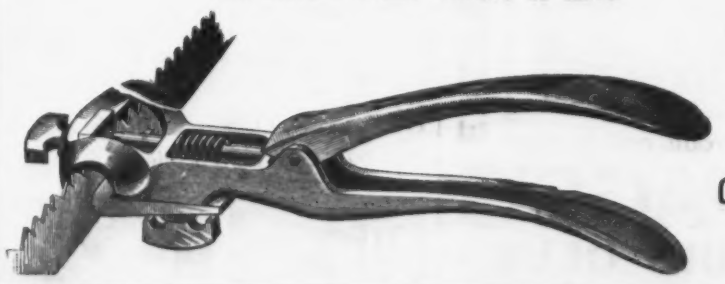

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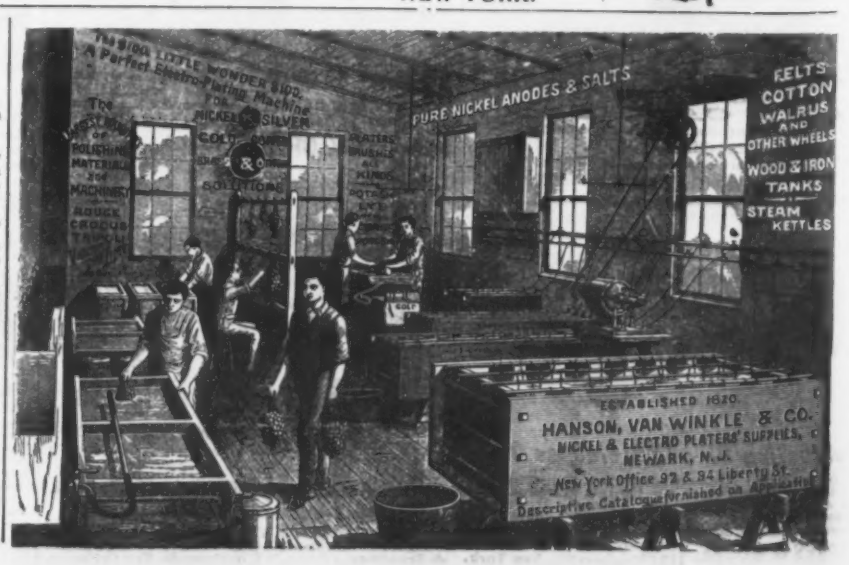

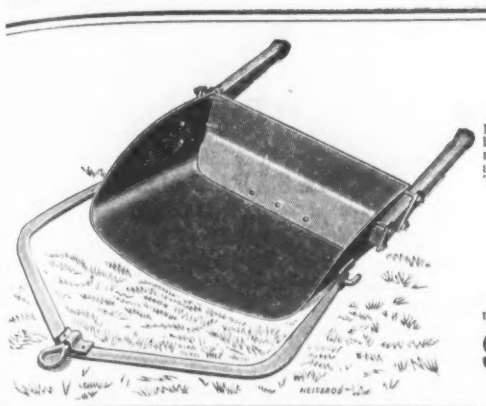

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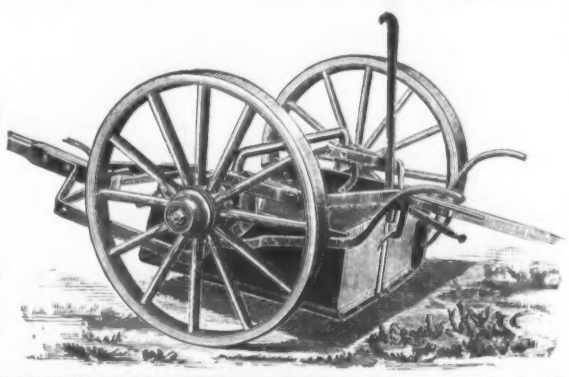

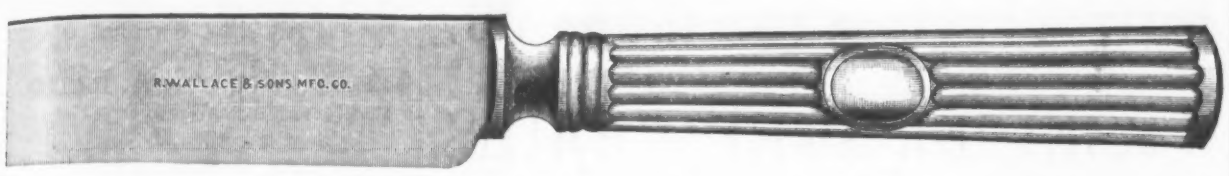

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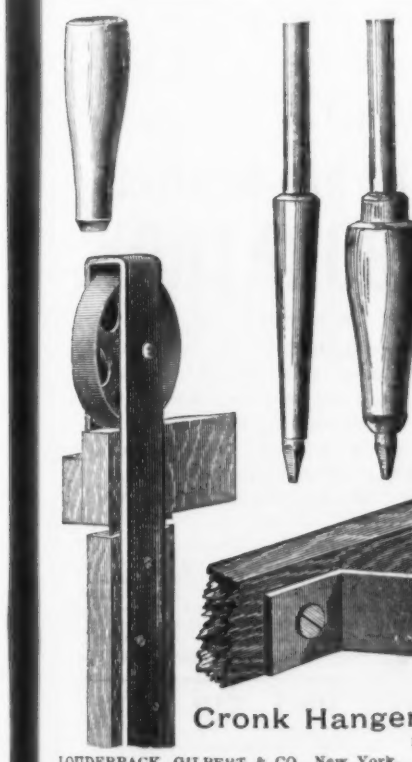

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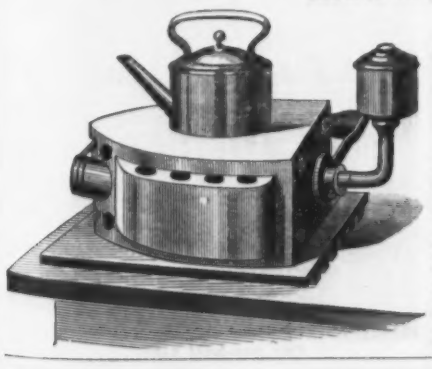

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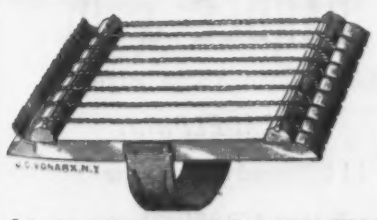

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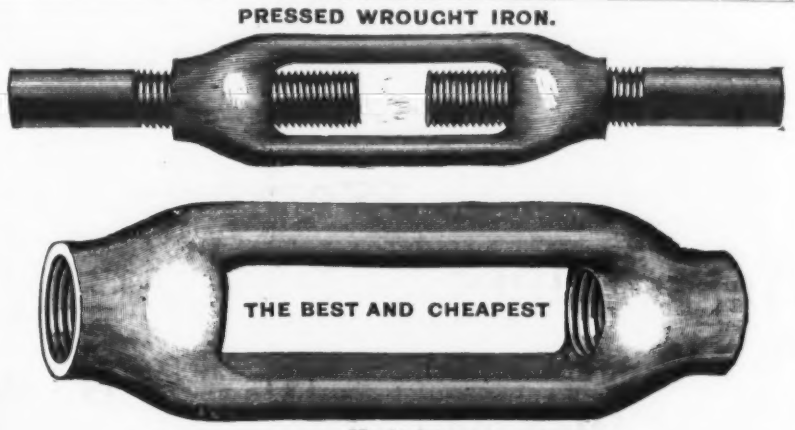

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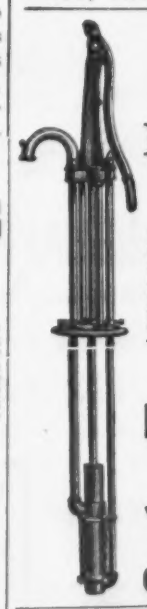

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QUEEN PAPER BRAND TRADE MARK WASHITA STONE

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Manufacturers of

CRESCENT STEEL,

IN BARS, SHEETS, COLD-ROLLED STRIPS, &c.

Polished, Compressed Drill Rods and Wire.

Warranted equal to any imported in *quality, finish* and *accuracy.*

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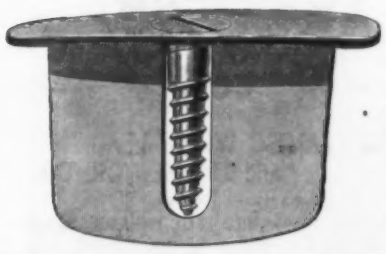

PATENTED NOVEMBER 21, 1882.

It Can Be Taken Out Easily.

The screw holds the wedge in place. Take out the screw and the wedge can be easily removed, allowing the handle to be withdrawn from the axe. Try them and you will buy no other. Send for sample.

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RHODE ISLAND HORSE SHOE CO.,

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Made without Waste, and Sold at a Reasonable Price.

Prong does not Enter (and weaken) the Shoe at the crease.

FULL SIZE CUT, NO. 0 MEDIUM.

Made in three lengths, viz., Short, Medium and Long, each pattern in a variety of sizes, both Blunt and Sharp. Patented Feb. 17, 1885. Prices quoted on application.

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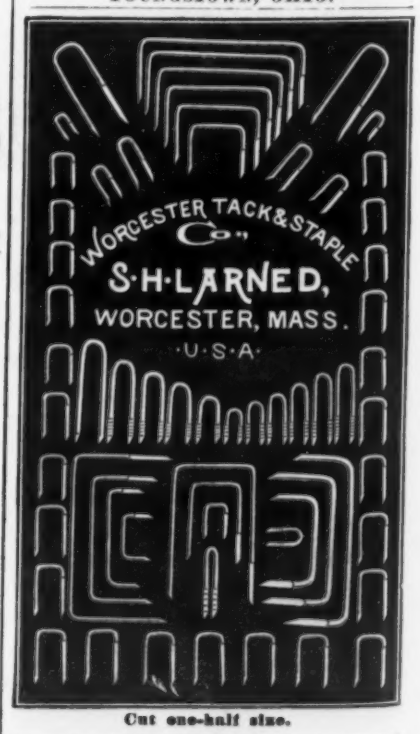

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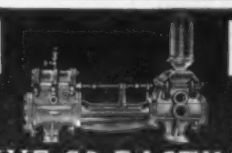

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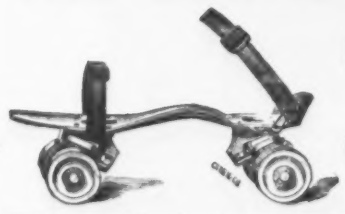

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G. W. Bradley's Edge Tools.

Butchers' Cleavers,
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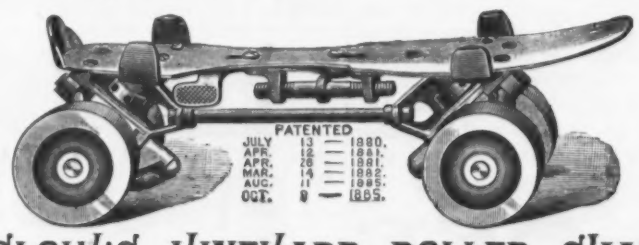
SEE PAGE 3.



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Claims advantages over other machines for general simplicity, adjustment of cutters, both vertically and horizontally, greater gripping power through use of compound levers, positive adjustable knock-off, uniform feed and automatic barbing attachment.

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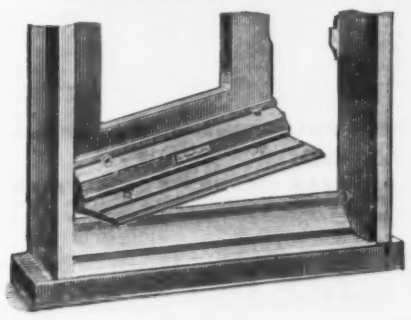

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Has no Springs, Triggers or Circle Irons; Positive Action; Cannot get out of order; Fits any Door.

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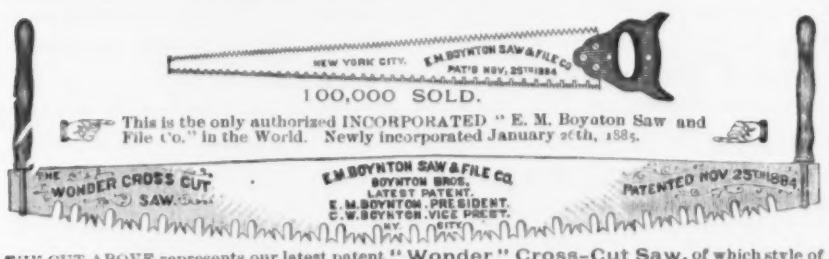

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THE CUT ABOVE represents our latest patent "Wonder" Cross-Cut Saw, of which style of teeth we shall use for our Cross-Cut One-Man Pruning and Buck Saw. This tooth has all the direct fast cut of the Lightning, combined with the clearing teeth of the Champion, making it, as its name indicates, the Latest Wonder, and by actual test we decide an advantage of 20 per cent. over our former world-renowned Lightning Saw. Having newly organized January 26th, 1885, as the E. M. Boynton Saw and File Co., we shall be prepared to fill any orders for the above, as well as for goods which have been furnished our customers throughout the world for the last 14 years.

Respectfully yours,

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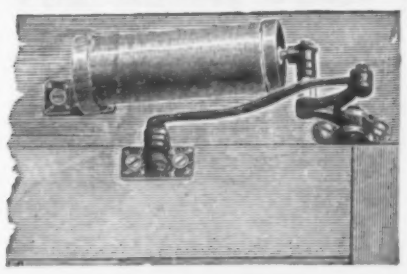
GREAT REDUCTION IN PRICE.



The SHAW DOOR CHECK AND SPRING CO have removed to their new factory, and with their increased facilities for manufacturing their goods have decided to **reduce the price of each Spring $1 from former list**, and thereby bring the machine within the reach of all. The SHAW CO. are the owners of the oldest patented device for closing doors noiselessly, and with their new improvement produce the only check and spring which the trade can sell as general hardware. The same spring can be applied to either hinge or jamb side of both right or left hand doors.

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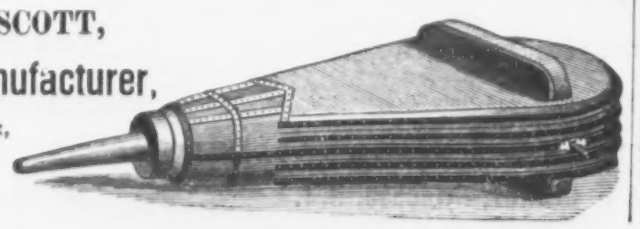

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Twenty years' practical experience.

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Tiles, Blast Furnace Blocks, &c., and in a *Special Department Linings* for *Stoves, Ranges* and *Heaters* of superior quality. Miners of and dealers in Woodbridge, N. J., Fire Clay and Fire Sand and Staten Island Kaolin.

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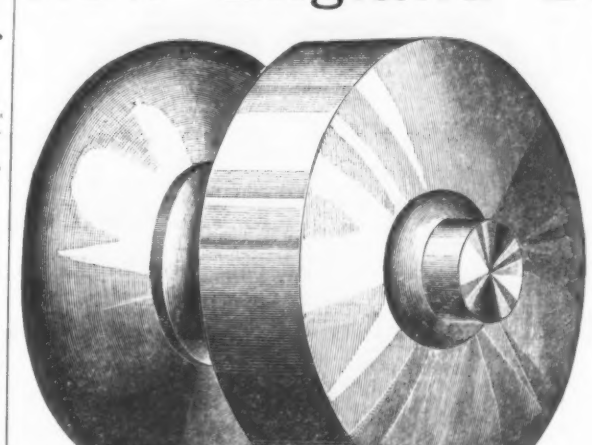

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Locks

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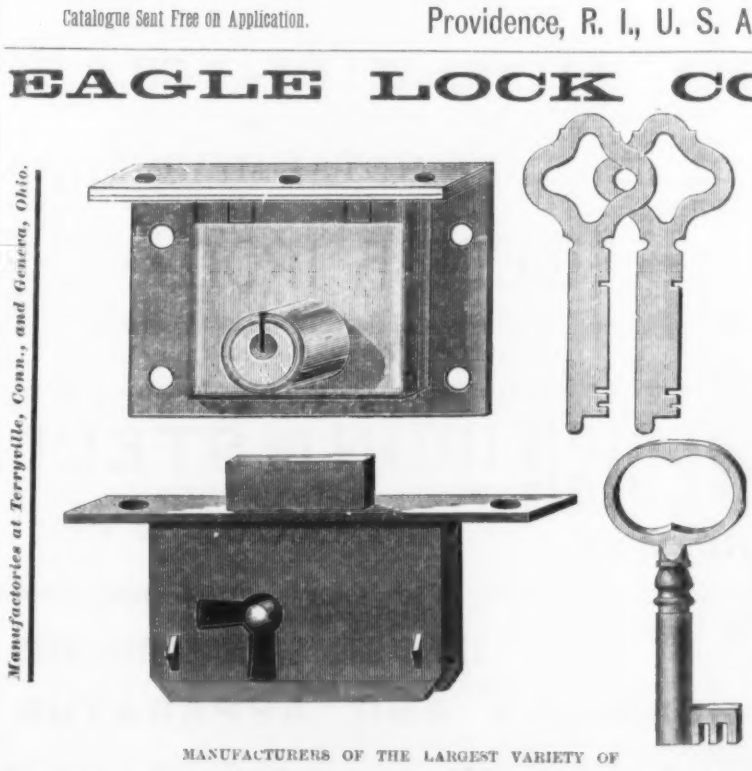

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"EUREKA" CLUB SKATES.

(Patented April 19, 1881.

BEST

Skates Made in This or Any Other Country.

SIZES, 8, 8½, 9, 9½, 10, 10½, 11, 11½, 12 Inches.

This Skate is simple in its construction, and has many advantages over other Skates. The new principle of operating the clamps gives great strength to the clamping of the heel. The pressure bar in front of the heel has a curved form, which braces the instep of boot or shoe, and prevents the turning of the foot while skating. The plates are of welded steel, carefully tempered and hardened. The superior care in tempering and workmanship gives the "Eureka" advantages that no other Skate has.

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Sands' Patent Triple Motion

WHITE MOUNTAIN ICE CRAEM FREEZER.

The only Freezer ever made having three distinct motions, thereby producing **finer, smoother Cream than any other Freezer on the market.** Acknowledged by every one to be the best in the world. **Over 300,000 in use to-day.** Outside Irons Galvanized, but all inside the can **coated with Pure Block Tin.** Tubs water-proof; easily adjusted and operated. We also carry large stock of Packing Tubs, Packing Cans, Ice Crushers, &c Send for Price List and Trade Discounts. Address

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Lloyd & Supplee Hardware Co.
Terms, 30 days. For 60 or 90 days, interest added at 8 per cent. per annum.

Anvils.
Peter Wright's, ℘ ℔ ... 9½ @ 10¢
Trenton ... 9½¢
Eagle Anvils, American, 10¢ ... dis. 20 %
Apple Parers.
Penn Apple Parers ... 5.50 net
White Mountain ... 5.50
Lots of 10 to 25 dozen, special prices.
Axes.
Hunt's Kentucky and Yankee, ℘ doz. net $6.50@7.00
William Mann, ℘ doz. net ... 6.50@7.00
Favorite ℘ doz. net ... 5.50@6.00
Beveled Axes ... add 50¢
Double Bit Axes. net ... $12.00
Augers and Auger Bits.—New List January 7, 1880.
Snell's Augers and Bits ... dis. 60@60&5 %
New Haven Copper Company ... dis. 60&10&5 %
Benjamin Pierce Auger Bits ... dis. 40 %
Jennings' Auger Bits, new list, Jan. 1, 1884. dis.. 25 %
Cook's Auger Bits and Augers ... dis 55 %
Snell's Ship Augers ... dis 15 @ 20 %
Watrous' Ship Augers ... dis. 15 @ 20 %
Bonney's Pat. Hol. Augers, list $48 ℘ doz dis 33⅓@40 %
Stearns' Pat. Hol. Augers, list $48 ℘ doz... dis. 20&10 %
Balances.
Light and Common ... dis. 40&10 %
Bells.
Bevin Bros. Mfg. Co. Light Hand Bells dis. 75&10@80 %
Light Hand Bells ... 80 %
Swiss Pattern Hand Bells ... 60 %
Connell's Door Bells ... dis. 20&10 %
Gt. Western & Kentucky Cow, new list ... dis. 70 %
Boring Machines
Upright, without Augers ... List, $5.50 }
Angular, without Augers ... List, 6.75 } ... dis. 50 %
Bolts.—Eastern Carriage Bolts, new list, June 10, 1884 ... dis. 80&5@80&7½ %
Philadelphia Carriage Bolts new list, dis 75&10@80 %
Stanley, Wrought Shutter ... dis. 50, 10, 10&5 %
Braces.—Barber's Improved ... dis. 40@40&5 %
Barber's Old Style ... 50 %
Backus, Polished ... dis. 50&10@50&10&10 %
Backus, Nickeled ... dis. 50&10 %
Spofford ... dis. 50&5 %
American Ball ... dis. 55&10 %
Amidon Improved ... dis. 60@60&10&5 %
Amidon Corner Brace ... dis. 40 %
Butts.—Cast Fast Joint, Narrow ... dis. 60&10 %
Cast Fast Joint, Broad ... dis. 60&10 %
Cast Loose Joint, Narrow ... dis. 70&10 %
Cast Loose Joint, Broad ... dis. 70&10 %
Cast Acorn, Loose Pin ... dis. 70&10 %
Cast Acorn, Japanned ... dis. 70&10 %
Cast Mayer's Loose Joint ... dis. 70&10 %
Wrought Loose Pin ... dis. 60&10&10@60&10&10&5 %
Wrought Table Hinges and Back Flaps .. dis. 60&10 @ 60&10&10 %
Wrought Loose Joint .. dis. 60&10&10@60&10&10&5 %
Wrought Narrow Fast ... dis. 60&10 @ 60&10&10 %
Blind Butts.
Parker ... dis. 75&2 %
Clark ... dis. 80 %
Shepard ... dis. 75&10&5 @ 80 %
Lull & Porter ... dis. 80&10 %
Huffer's ... dis. 50 %
Casters.—Bed (new list July 1, 1880) } dis. 60&5@60
Plate } &10 %
Chains.—German Halter and Coil, list June, 1884 ... dis. 55 @ 55&5 %
Galvanized Pump ... ℘ ℔ 5¾@6¼¢ net
Best Proof Coil Chain—English.
℘ ℔ ... 9¼ 6¾ 5¾ 5¼ 5 4¾
3-16 ¼ 5-16 ⅜ 7-16 ½
Chisels.—Socket Framing ... dis 75&10@75&10&5 %
Socket Firmer ... dis 75&10@75&10&5 %
Butcher's ... $5.00@$5.25 to £ gold
Coffee Mills.—Box and Side (new list Jan. 1, 1880 ... dis 40 @ 40&10 %
Enterprise ... dis 20&10 %
Cutlery.—Walden Pocket ... new list net
Pennsylvania Knife Co ... new list net
Landers, Frary & Clark, J. Russell & Co., Lamson & Goodnow Mfg. Co. and Meriden Cutlery Co., Manufacturers' prices net.
Door Hangers.—Cronk Barn Door Hangers...No. 4, $12.00; No. 5, $14.00; No. 6, $18.00. dis. 50&5@50&10 %
Drawing Knives.
Hart Mfg. Co.'s ... dis. 75&10@75&10&5 %
Adjustable Handle ... dis 20@20&5 %
Fry Pans.
Tinned ... dis 45 %
℘ doz... $3.50 4.00 4.50 5.00 5.50 6.50 7.50 9.00 10.00
No. ... 0 1 2 3 4 5 6 7 8
Burnished ... dis. 70@70&5 %
℘ doz.... $3.00 3.75 4.25 4.75 5.25 6.00 7.00 8.00 9.00
No. ... 0 1 2 3 4 5 6 7 8
Files.
Nicholson ... dis 60@60&10 %
Disston ... dis 60@60&10 %
Butcher ...
Crown and Arrow ... 60&5@60&10 %
Fluting Machines.
Eagle—3½ in. roll ... each, $2.15 }
Eagle—5½ in. roll ... each, 2.85 } dis 35 %
Crown—4½ in. roll ... each, 3.50 }
Crown—6 in. roll ... each, 4.00 } dis 35 %
Crown—8 in. roll ... each, 6.50 }
Geneva Fluter ... dis 25 %
Favorite com. Fluter and Sad Iron.. ℘ doz., $10.50 net
Hammers.
Yerkes & Plumb's, new list ... dis 40&10 %
Maydole Hammers ... dis 15&10 %
Howell A. E. Nail Hammers ... ℘ doz., net $3.75
Handles.
Disston Loop Handles Cross-Cut ... 33¢ pair net
Boynton Loop Handles Cross-Cut ... 22¢ pair net
Hatchets.
Yerkes & Plumb, new list ... dis 40&10&5 %
Hunt ... dis 40 %
Hay and Straw Knives.
Lightning ... ℘ doz., $18.00 dis. 10@10&10 %
Electric ... ℘ doz., $12.50 net.
Wadsworth ... ℘ doz., net 35&5 %
Walton Straw Knives ... ℘ doz., net 17.00
Hinges.
Strap and T ... dis 65&10 %
Horse Nails. Nos. 5 6 7 8 9 10
Globe ... 26 23 21 20 19 18 dis 10&5&5 %
Ausable ... 30 27 25 24 23 22 dis 25&10 %
" Pol'ed and P't'd & Blued & P't'd. 31 28 26 25 24 23 dis 25&10 %
Clinton ... 23 21 20 19 18 dis 25&10 %
" Pol'ed & P't'd. 24 22 21 20 19 dis 25&10 %
Saranac ... 26 23 21 20 19 18 .. dis 20 %
Locks and Knobs.
Branford Locks ... 66⅔&2 %
Gaylord Cabinet ... dis 40&2 %
Parker's Cabinet ... dis 40&2 %
American Padlocks ... dis 66⅔&2 %
Scandinavian Padlocks ... dis 50 %
℘ doz.. $5.00 5.50 6.50 7.50 8.50 10.00 12.50 }
No. ... 57 58 59 60 61 62 63 } dis 60 %
℘ doz ... $18.00 26.00 33.00 }
No. ... 64 65 66 } dis 60 %
Lanterns.
Buckeye ... large list, net; small list, net
Tubular ... No. 0, $7.50; No. 1, $9.00 ℘ doz. net
Guards 40¢ extra.
Lawn Mowers.—Pennsylvania }
Philadelphia }
Excelsior } 40&10&3 % cash 30 days.
Continental }
Quaker City }
Lawn and Garden Pumps.
Holland Patent ... list, $5.00, dis 10 %
Mattocks.
Long and Short Cutter ... new list, 60&10 %
Pennsylvania Pattern ... dis 60& 10 %
Molasses Gates.
Enterprise Mfg. Co.'s Measuring Faucets. dis. 20&10 %
Stebbins' Gates ... dis. 75@75&5 %
Lincoln's Gates ... dis. 70&10 %
Landers, Frary & Clark's Petroleum ... dis 33⅓&10 %
Brass Liquor Cocks new list Jan. 1, 1880. dis.. 65&5 %
Cork Lined Cocks ... dis. 70 %
Meat Cutters.
Dixon's ... dis. 40 %
Woodruff ... dis. 40 %
Stowe ... dis. 40 %
Hale's ... new list, dis. 60, 10&2 cash
American ... dis 35 %
Stuffers ... dis. 40 %
Enterprise Stuffers ... dis. 20&10 %
Planes.—Sandusky Tool Co ... dis. 20&2 %
Ogontz ... dis. 25&2 %
Ohio and Auburn ... dis. 20&2 %
Bailey (S. R. & L. Co.) ... dis. 20&10 %
Plane Irons.—Ohio Tool Co ... dis. 20&10 %
Butcher's ... $5.00 @ 5.25 to £
Plumbs and Levels.
Stanley's Adjustable ... dis. 70&10 %
Stanley's Non-Adjustable ... dis. 70&10 %
Picks.—New list ... 60&5@60&10 %
Razor Strops.
Lamont Combination ... ℘ doz. $4.00
Lamont Combination ... 1 gross lots $42.00
Imitation Emerson ... ℘ doz. $2.00
Lamoille, 1 doz. lots ... $3.50 net
" 1 gro. " ... $38.00 net
Rules.—Stanley Boxwood ... dis. 80&5@80&10 %
Stanley Ivory ... dis. 55 @55&10 %
Steelyards.—Hart's Pattern dis ... 40&10@50 %
Per doz ... $14.50 17.75 21.00 26.50 31.00 35.50
Lbs ... 50 100 150 200 250 300
American Pattern ... dis. 40&10@50 %
Per doz ... $8.00 10.25 13.75 15.60 16.75 19.50
Lbs ... 50 100 150 200 250 300
Scale Beams ... 60&5@60&10 %
Custers ... 25 %
Squares.
Steel and Iron. dis. 60&10 %; full cases dis. 60&10&10 %
Try Squares, Stanley ... dis 60&10 %
Disston's Try Squares ... dis 45&10 %
Scythes.—Golden Clipper, Damascus Blade, Boxed and Sharpened ... ℘ doz $9.00 }
Clipper No. 10, Bronzed Blade, Boxed and Sharpened ... ℘ doz $8.50 } 33⅓
Clipper No. 5, Painted Red, Boxed and Sharpened ... ℘ doz $8.00 }
Saws.—Disston's Hand, Panel and Rip ... dis 20&10 %
Disston's Circular ... dis 45&10 %
Cross-Cut No. 2, Plain Tooth ... dis 45&10 %
Cross-Cut Patent Tooth ... dis 45&10 %
Cross-Cut Champion Tooth ... dis 45&10 %
Shovels and Spades.
Oliver Ames & Sons, new list ... dis 20 %
Griffiths ... dis 50&10@60 %
Rowland ... dis 60&5@60&10 %
Sad Irons.—1 to 10 ℔ ... ℘ ℔ 2¼@2½¢
Mrs. Potts' Patent ... dis 40 %
Stone.
Washita Extra ... ℘ ℔ 17@18¢
Washita No. 1 ... ℘ ℔ 14@14½¢
Washita No. 2 ... ℘ ℔ 11¼@11½¢
Washita Slips ... ℘ ℔ 28@20¢
Washita Axe ... ℘ ℔ 14¢ net
Hindostan Oil Stone No. 1 ... ℘ ℔ 3¼¢
Hindostan Axe Stone ... ℘ ℔ 8¢. dis. 40 %
Hindostan Slips ... ℘ ℔ 10¢. dis. 40 %
Screws.—Parker List.
Flat Head Iron ... dis 85 %
Flat Head Brass ... dis 85 %
Round Head Brass ... dis 83⅓ %
Round Head Iron ... dis 83⅓ %
Spoons.
Plated ... dis 50&10 %
German Silver ... dis 40&10@50 %
Britannia, Boardman's ... dis 60 %
Britannia, Parker's ... dis 60&10 %
Tinned ... dis 10 %
Springs.—Torrey ... dis 50 %
Gem No. 3 small Japanned ... $2.00 }
Gem No. 2 medium Japanned ... 2.75 } dis 50&10 %
Coil No. 10 ℘ gross net ... $5.50@6.00
Other Standard Springs ... dis 50&10@60 %
Warner Door Springs, ℘ doz. $2.50 ... dis 40&10 %
Standard Spring Hinges—
Single No. 0, ℘ doz. net ... $1.10@1.25
Single No. 1, ℘ doz. net ... 1.25@1.50
Other Standard Spring Hinges ... dis 25&10@40 %
Stocks and Dies ... dis 10 and 5 %
Stove Polish.—Gem ... ℘ gross, $4.50, dis 5 %
Dixon ... 6.00, dis 10 %
Fire Fly ... $3.00 gross. net
Tacks ... Combination discounts
Shoe Nails—4-8, and over, 5½¢ }
Shoe Nails—3½-8, and under 7¢ } 10 %
Double Pointed Tacks ... dis 75&10 @ 75&10&5 %
Traps.
Genuine Oneida—Newhouse ... dis 35 %
Im. Oneida—Newhouse list. First qual. dis 60&10&10 %
Vises.—Solid Box. Trenton new list .. dis 50&10@60 %
Wrenches.—Agricultural ... dis 75&10&5 %
Coes' Genuine ... dis 60&3 %
Coes' Mechanics' ... dis 60&10&3 %
Coes' Mechanics,' Mall. Bar ... dis 80 @ 80&5 %
Wire.
Bright or Annealed, No. 0 to 18 ... dis 70 %
Bright or Annealed, No. 19 to 26 ... dis 70 %
Bright or Annealed, No. 27 to 36 ... dis 75 %
Coppered, 0 to 18 ... dis 65 %
Tinned Broom Wire ... dis 65 %
Galvanized Barb Wire ... 5½¢
Painted Barb Wire ... 4¾¢
Galvanized. No. 7 to 18...Market List, dis ... 60 %
Wringers.
Peerless No. 2½ ... $30.00
Peerless No. 2 ... 33.00
Universal No. 2½ ... 30.00
Universal No. 2 ... 33.00
Novelty No. 2, for common tubs ... 30.00
Novelty No. 3, " " ... 34.50
Excelsior E, for stationary tubs ... 39.00
Excelsior F " " ... 43.50
} dozen lots $3.00 per dozen.

PITTSBURGH.

Merchant Iron.
TERMS.—Note or acceptance at 60 days, with current rate of exchange on New York, or a discount of 2 ℘ cent. for cash, if remitted within 10 days from date of invoice.
For fluctuations and discounts on card rates see weekly Pittsburgh Trade Report.
The following are card rates.

Flat Bar.
1⅛ to 4 by ⅜ to 1 inch ... 2.0¢
4¼ to 6 by ⅜ to 1 " ... 2.1¢
1⅜ to 6 by 1⅛ to 1½ " ... 2.4¢
1¼ and 1⅛ by ⅜ to ¾ " ... 2.1¢
1 and 1⅛ by ⅜ to ¾ " ... 2.2¢
⅝, ¾ and ⅞ by ⅜ to ⅝ inch ... 2.4¢

Rounds and Squares.

1 to 1⅞	2.0¢	⅜ to 9-16	2.2¢
2 to 2⅝	2.2¢	½ to 7-16	2.4¢
2¾ to 3¼	2.5¢	⅜	2.6¢
3⅜ to 4	3.0¢	5-16	2.8¢
4⅛ to 5	3.5¢	¼	3.0¢
¾ to ⅞	2.1¢	3-16	5.0¢

Oval Iron.

⅞ to 1⅛	2.4¢	⅝	2.8¢
⅜ to ¾	2.6¢	½	3.2¢

Half Oval and Half Round.

⅞ to 1¼ inch	2.7¢	½ inch	3.5¢
⅝ to ¾ "	3.2¢	⅜ "	5.0¢

Horse Shoe.
⅝ to 1⅛ by 5-16 to ⅞ inch ... 3.0¢

Wagon Box Iron.
⅞ inch, Nos. 13 and 14 ... 3.2¢
⅞ " " 11 and 12 ... 3.0¢
¾ " " 13 and 14 ... 3.5¢
¾ " " 11 and 12 ... 3.3¢
⅝ " " 13 and 14 ... 3.9¢
⅝ " " 11 and 12 ... 3.6¢

Heavy Bands.
3¼ to 6 by ¼ and 5-16 inch ... 2.2¢
1¾ to 3¼ by ¼ and 5-16 " ... 2.2¢
1 to 1⅝ by ¼ and 5-16 " ... 2.3¢
¾ to ⅞ by ¼ and 5-16 ... 2.5¢
⅝ and ½ by ¼ and 5-16 " ... 3.0¢

Light Bands.
1½ to 6 by ⅛ to 3-16 ... 2.5¢
1½ to 6 by Nos. 11 and 12 ... 2.6¢
1 to 1⅜ by ⅛ to 3-16 ... 2.6¢
1 to 1⅜ by Nos. 11 and 12 ... 2.7¢
⅞ and 13-16 by ⅛ to 3-16 ... 2.9¢
⅞ and 13-16 by Nos. 11 and 12 ... 3.0¢
¾ and 11-16 by ⅛ to 3-16 ... 3.2¢
¾ and 11-16 by Nos. 11 and 12 ... 3.3¢
⅝ and 9-16 by ⅛ to 3-16 ... 3.5¢
⅝ and 9-16 by Nos. 11 and 12 ... 3.6¢
½ inch by ⅛ and 3-16 ... 3.8¢
½ inch by Nos. 11 and 12 ... 3.9¢

Hoop Iron.
1¼ to 4, Nos. 13, 14 and 15 ... 2.8¢
1¼ to 2, Nos. 16, 17 and 18 ... 2.9¢
1¼ to 2, No. 19 ... 3.0¢
1¼ to 2, No. 20 ... 3.1¢
1¼ to 2, No. 21 ... 3.2¢
1¼ to 2, No. 22 ... 3.3¢
15-16, 1, and 1⅛, Nos. 13, 14 and 15 ... 3.0¢
15-16, 1, and 1⅛, Nos. 16, 17 and 18 ... 3.1¢
15-16, 1, and 1⅛, Nos. 19 and 20 ... 3.2¢
15-16, 1, and 1⅛, No. 21 ... 3.3¢
15-16, 1, and 1⅛, No. 22 ... 3.4¢
⅞, Nos. 13, 14 and 15 ... 3.2¢
⅞, Nos. 16, 17 and 18 ... 3.3¢
⅞, Nos. 19 and 20 ... 3.4¢
⅞, No. 21 ... 3.5¢
⅞, No. 22 ... 3.6¢
13-16, Nos. 13, 14 and 15 ... 3.4¢
13-16, Nos. 16, 17 and 18 ... 3.5¢
13-16, Nos. 19 and 20 ... 3.6¢
13-16, No. 21 ... 3.7¢
13-16, No. 22 ... 3.8¢
¾, Nos. 13, 14 and 15 ... 3.5¢
¾, Nos. 16, 17 and 18 ... 3.6¢
¾, Nos. 19 and 20 ... 3.7¢
¾, No. 21 ... 3.8¢
¾, No. 22 ... 3.9¢
11-16, Nos. 13, 14 and 15 ... 3.7¢
11-16, Nos. 16, 17 and 18 ... 3.8¢
11-16, Nos. 19 and 20 ... 3.9¢
11-16, No. 21 ... 4.0¢
11-16, No. 22 ... 4.1¢
⅝, Nos. 13, 14 and 15 ... 3.9¢
⅝, Nos. 16, 17 and 18 ... 4.0¢
⅝, Nos. 19 and 20 ... 4.1¢
⅝, No. 21 ... 4.2¢
⅝, No. 22 ... 4.3¢
⅝, No. 23 ... 4.4¢
9-16, Nos. 13, 14 and 15 ... 4.1¢
9-16, Nos. 16, 17 and 18 ... 4.2¢
9-16, Nos. 19 and 20 ... 4.3¢
9-16, No. 21 ... 4.4¢
9-16, No. 22 ... 4.5¢
9-16, No. 23 ... 4.6¢
½ inch, Nos. 13, 14 and 15 ... 4.3¢
½ inch, Nos. 16, 17 and 18 ... 4.4¢
½ inch, Nos. 19 and 20 ... 4.6¢
½ inch, No. 21 ... 4.7¢
½ inch, No. 22 ... 4.8¢
½ inch, No. 23 ... 4.9¢
The prices under Hoop Iron do not apply to Cotton Ties.
1-10¢ ℘ ℔ extra will be charged for each gauge lighter than the lightest indicated.
1-10¢ ℘ ℔ extra will be charged for cutting Hoops to specified lengths.

Barrel Hoops.
1¼ to 2 in., cut to length.
9 to 11 ℔, ℘ set of 6 hoops ... 3.0¢
8 ℔ and less than 9 ℔, ℘ set of 6 hoops ... 3.1¢
Less than — ℔, ℘ set of 6 hoops ... 3.2¢
Extras for Cutting to Length all Preceding Iron.
All Iron, including Tire ... 1.10¢

Tank Iron.
No. 9 and heavier ... 2.8¢
Plow Slabs ... 3.0¢
Plow Wings ... 3.3¢

Sheet Iron.

	Common.	Charcoal.	Juniata.
Nos. 10 to 14	3.0¢	4.5¢	6.0¢
Nos. 15 to 17	3.3¢	4.8¢	6.3¢
Nos. 18 to 21	3.6¢	5.1¢	6.6¢
Nos. 22 to 24	3.8¢	5.3¢	6.8¢
Nos. 25 and 26	4.0¢	5.5¢	7.0¢
No. 27	4.2¢	5.7¢	7.2¢
No. 28	4.6¢	6.1¢	7.6¢

All sheets No. 18 and lighter, over 30 inches wide, not less than 2.10¢ extra.

Wood's Patent Planished Sheet.
1st quality (A) ... 10¢ | 2d quality (B) ... 9¢
Galvanized C. H. B.—(Charcoal Hammered Blooms.)

Nos. 14 to 20	12¢	No. 27	15¢
Nos. 21 to 24	13¢	No. 28	16¢
Nos. 25 and 26	14¢	No. 29	18¢

57 @ 60 % discount.

Coal Screen Iron.
1⅜ by ⅝ by 5-16 ... 2.5¢ | 1 by ⅝ by 5-16 ... 3.0¢

Angle Iron.
2¼, 3, 3½ and 4 inch ... 2.8¢
1⅝, 1¾, 2 and 2¼ " ... 2.8¢
1½ inch ... 2.9¢
1 " ... 3.1¢
1¼ by 1 inch, for Plow Handles ... 3.3¢
1⅛ by ¾ " " " ... 3.3¢
1⅜ by ⅝ " " " ... 3.4¢

T Rail.

8 lbs. to the yard	2.4¢	20 lbs. to the yard	2.3¢
12 " "	2.3¢	25 " "	2.3¢
16 " "	2.3¢	30 " "	2.3¢

Splice Joints for 12, 16 and 20 ℔. Rail, 30¢ each; 25 and 30-℔. Rail, 40¢ each; 40-℔., 50¢ each.
3½ by ⅜ and ½ Spikes for 20 and 28-℔. Rail ... 3¼¢
2½ and 3 by ⅜ " " 12 and 16-℔. " ... 3.5¢
2½ by 5-16 " " 8-℔. Rail ... 4.0¢
Flat Rails.—Punched and Countersunk.
1⅛ to 2 by ¼ to ⅜ inch ... 2.5¢
1⅛ by ⅜ and 7-16 inch ... 2.7¢
1⅛ by ⅜, 7-16 and ⅜ inch ... 3.0¢

Juniata Nail Rods ... 6.0¢
Norway Nail Rods ... 7.5¢
Guard Iron, ⅜x⅝x⅝ and ⅜x⅝x¾ ... 3.5¢
Guard Iron ⅜x⅝x9-16 and ⅜x⅝x½ ... 3.7¢
Drag Bars ... 2.8¢
Dropper Bars ... 3.3¢
Cylinder and Landside Iron ... 2.7¢
Plow Beam Iron ... 2.5¢

Nails.
See Pittsburgh Trade Report.

Best Quality Refined Cast Steel.
Square, Flat, Octagon and Round.
⅜ to 2 inches, inclusive ... 8½¢
1-16 and 2¼ to 3 inches ... 9½¢
⅛ and 3¼ to 4 " ... 10½¢
7-32 and 4½ to 5 " ... 11½¢
3-16 and 5½ to 6 " ... 14¢
5-32 inch ... 18¢
⅛ " ... 25¢
Oil Well Steel Forgings ... 18¢

Machinery Steel.

	Crucible	Bessemer & Open Hearth.
Ordinary Sizes, ⅜ to 2 inch Round	4¢	3¢
5-16 and 2½ to 3 inches	5¢	4¢
¼ and 3¼ to 6 "	6¢	5¢
7-32 inch	7¢	6¢
3-16 "	9¢	8¢

Square, Flat and Octagon, ½¢ extra throughout the list.
Cut to specified lengths, ½¢ extra.

Hammer Cast Steel.
Crucible Cast Steel ... 5¢
Open Hearth Cast Steel ... 4¢

Sheet Steel.—Crucible.

	Best.	2d Qual.	3d Qual.	Bessemer & Open Hearth.
To 21 gauge	9¢	8¢	6¢	5¢

1¢ extra for each additional gauge.
Cut to multiples or specified lengths, ½¢ extra.

Miscellaneous Cast Steel.
Auger and Auger Bit ... 3¢
Axle Steel for carriages and wagons ... 3¢
Frog Points and Plates ... 5½¢
Frog Side Bars ... 5¢
Pick, plain (hammered) ... 5¢
Pick and Mattock, beveled (rolled ... 3¢
Skate Steel ... 4½¢
Table Cutlery, plain ... 3½¢
Table Cutlery, beveled ... 4¢
Pike and Cant Hook ... 7¢
Coal and Granite Wedge ... 7¢
Roller ... 5½¢
Spindle, subject to Machinery classification ... 5½¢
Trap Spring Steel ... 6¢
Forged Crank Pins and Lathe Spindles ... 7½¢
Piston Rods, plain ... 4¢
Piston Rods, forged to shapes ... 7½¢
Slide Bars, plain ... 5¢
Slide Bars, forged to shapes ... 7½¢

Open Hearth or Bessemer
Boiler, Fire-Box and Flue Sheets, not less than 3-16 thick ... 4¢
Boiler, Fire-Box and Flue Sheets, not less than ¼ thick ... 5¢
Circulars and semi-circulars, when ordered separately ... 6¢
Smoke Stack, to shape ... 5¢
Locomotive Tank Steel ... 4¢

File Cast Steel.
Square, Round, Half Round and Flat Bastard, 8 inch and over ...
Mill Saw, 8-inch and over ... 5¢
Taper, 3½-inch and over ... 6¢
Horse and Shoe Rasp ... 5¢

Spring Cast Steel ... 4¢
Spiral, Taper, cut to lengths ... 5½¢

Tire Cast Steel.
1x¼ and over ... 6½¢
1x3-16, ⅞x3-16 and ¼ ... 7¢
1 and 13-16x⅛ and 5-32, ¾x3-16 and 5-32 ... 9¢
⅝ and ⅝x⅛ and 3-32 and 12 g ... 10¢
Solid Safe Cast Steel ... 4¢
Three and Five Ply Cast Steel ... 5¢

Agricultural Implement Cast Steel.
Fork and Rake, Crucible ... 4½¢
Horse Rake Steel, cut to lengths, Crucible ... 5¢
Hoe, Crucible ... 5¢
Corn Stalk Cutter, beveled ... 4½¢
Beveled Hoe and Shovel Steel in Bars ... 4½¢
Crucible Plow Steel in Slabs ... 4½¢

Bessemer and Open Hearth.
Spring ... 2½¢
Spring spiral and taper, cut to lengths ... 3½¢
Tire, 2-16 thick and above ... 2½¢
Toe Calk ... 2½¢
Plow ... 2½¢
Axle Billets ... 2 ¢
Sleigh Shoe ... 2½¢
Cutter Shoe, cut to lengths and tapered ... 3¢
Scythe Back Steel ... 3½¢
Grain Drill Bars ... 2½¢
Grain Drill Points ... 3½¢
Rolling Coulter Blanks, cut and punched ... 6¢
Thrasher Steel ... 2½¢
Thrasher Teeth ... 3½¢
Rolled Hammer Billets ... 2½¢
Terms.—Four months; 3 per cent. discount for cash, if remitted within 30 days.

Rolls and Castings.
Furnace Floor and Straightening Plates ... 1½¢
Housings and Castings not otherwise specified ... 2 ¢
Guide Plates ... 2½¢
Spindles and Coupling Boxes ... 1¾¢
Sand Rolls and Pinions, large size ... 2 ¢
Sand Rolls and Pinions, small size ... 2¼¢
Pipe Mill Castings ... 3 ¢
Rolling Mill Castings under 50 ℔ ... 2 ¢
Spur and Bevel Wheels, large ... 3¢
Spur and Bevel Wheels, small ... 3½¢
Pulleys up to 30 inches ... 4 ¢
Pulleys over 30 inches ... 3½¢
Engine Castings, light ... 3½¢
Engine Castings, heavy ... 2¾¢

White and Red Lead.
Strictly Pure White Lead in Oil, in Kegs 6¼¢ ℘ ℔ in 25 ℔ Cans, packed in 100 ℔ cases, ½¢, and 12½ ℔ cans' 1¢ over keg price; in 1 to 5 ℔ Cans, assorted, in 100 ℔ cases, 2¼¢ over keg price.
Strictly Pure Dry White Lead in kegs ... 6¼¢ ℘ ℔
Strictly Pure Red Lead *extra bright and fine*, in kegs ... 6¼¢
Strictly Pure Litharge, *powdered, extra fine*, in kegs 6¼¢
Orange Mineral, *True*, in barrels ... 8¼¢
" " in 100 ℔ kegs ... 8½¢
A discount of 3% will be deducted from Invoice on purchase of 500 ℔ and upward.
Terms: Note or acceptance at 60 days; or less 2½ % for cash if paid within 15 days from date of invoice. Freight equalized with all points where White Lead is made.

Window Glass.
Discount, 75% *Single Strength* 75 & 10% *Double.* Prices current, ℘ box of 50 feet.

Single Strength.

United Inches	Sizes.	AA.	A.	B.	C.
25	6 x 8 to 10 x 15	$8.75	$8.00	$7.50	$7.00
39	11 x 14 to 15 x 24	9.25	8.50	8.00	7.25
48	16 x 24 to 20 x 28	10.75	9.75	8.75	7.75
54	15 x 34 to 24 x 30	12.25	10.75	9.00	....
60	26 x 28 to 24 x 36	13.00	11.50	9.75	....
70	26 x 36 to 26 x 44	14.50	13.25	10.75	....
80	26 x 46 to 30 x 50	15.00	14.00	11.25	....
84	30 x 52 to 30 x 54	....	....	....	....
90	30 x 56 to 34 x 56	....	....	....	....
94	34 x 58 to 34 x 60	....	....	....	....
100	36 x 60 to 40 x 60	....	....	....	....
	Double Strength.				
25	6 x 8 to 10 x 15	13.25	12.25	11.25	10.50
39	11 x 14 to 15 x 24	14.50	13.25	12.50	11.25
48	16 x 24 to 20 x 28	17.25	15.75	14.00	....
54	15 x 34 to 24 x 30	19.75	17.25	14.50	....
60	26 x 28 to 24 x 36	*21.00	18.50	15.75	....
70	26 x 36 to 26 x 44	23.25	21.25	17.25	....
80	26 x 46 to 30 x 50	24.00	22.50	18.00	....
84	30 x 52 to 30 x 54	25.75	23.25	19.25	....
90	30 x 56 to 34 x 56	27.75	25.00	21.75	....
94	35 x 58 to 34 x 60	29.25	27.75	24.00	....
	36 x 60 to 40 x 60	33.25	30.00	27.75	....

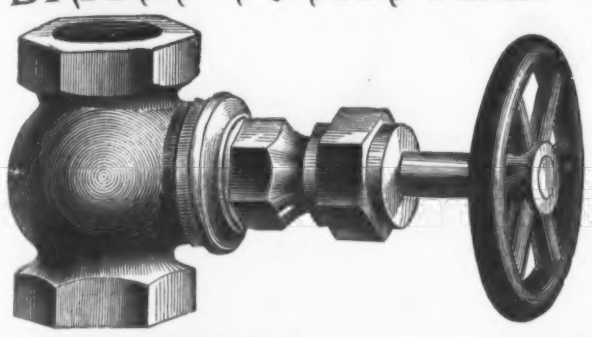
Sizes above — $10 ℘ box extra for every 5 inches.
An additional 10 per cent. will be charged for all glass more than 40 inches wide. All sizes above 52 inches in length, and not making more than 81 united inches, will be charged in the 84 united inches bracket.

Hubbard, Bakewell & Co.'s Goods.
Axes, Single Bit, Lippincott ... per doz., $6.50
Axes, Single Bit, James & Co ... per doz., 5.50
Axes, Double Bit, Lippincott ... per doz., $12.00
Axes, Double Bit, James & Co ... per doz., 10.00
Drain Tools, list ... dis 20&7½ %
Hoes, Planters' ... dis 60 %
Hoes, Scovill Pattern ... dis 60 %
Hoes, Handled, Square Eye, German ... dis 60 %
Handles, Cross Cut ... per doz., $2.25
Handles, Shovel, Bent, Bored, Riveted .. per doz., 2.00
Saws, Circular ... dis 50 %
Saws, Long ... dis 45 %
Saws, Cross-Cut, H. B. & Co., Champion, per foot net ... $0.27
Saws, Cross-Cut, Lippincott, Champion, per foot net ... $0.25
Shovels, list ... dis 20&7½ %
Spades, list ... dis 20&7½ %
... dis 20&7½ %

McNab & Harlin Mfg. Co.,

MANUFACTURERS OF

BRASS COCKS AND VALVES



For Steam, Water, and Gas.

WROUGHT IRON PIPE & FITTINGS

Plumbers' Materials.

Factory, Paterson, N. J. 56 John Street, N. Y.

Our new Illustrated Catalogue and Price List is now ready, and will be sent to the Trade with their first order, or by express, if desired, before ordering.

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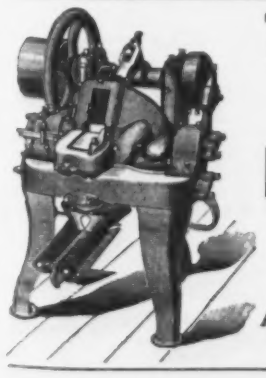

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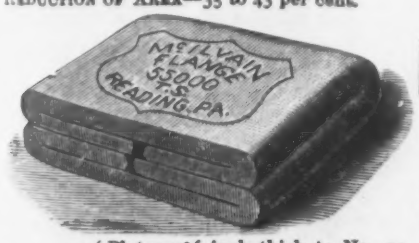

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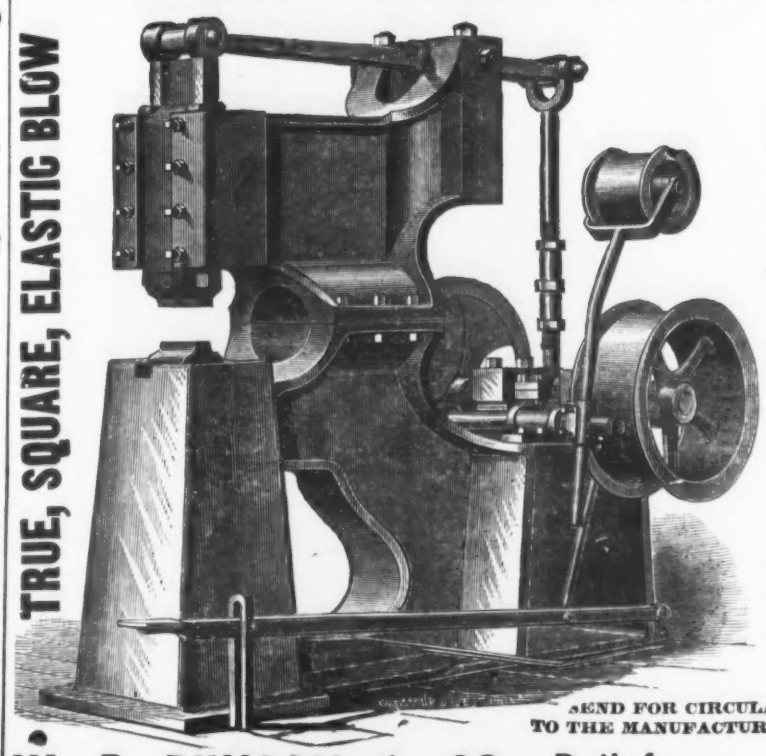

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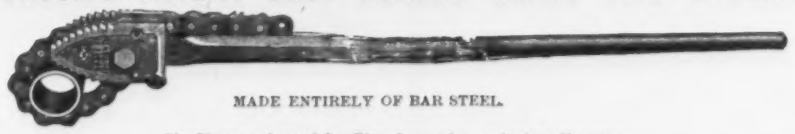

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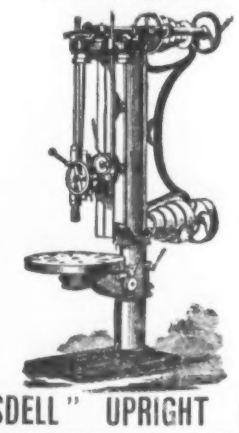

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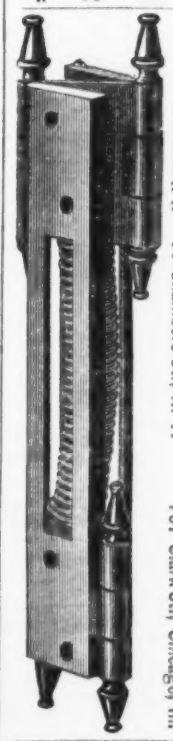

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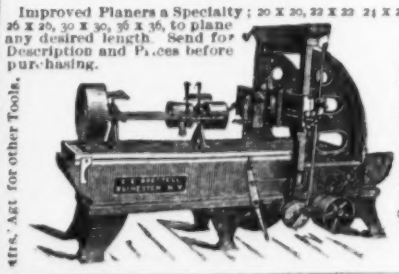

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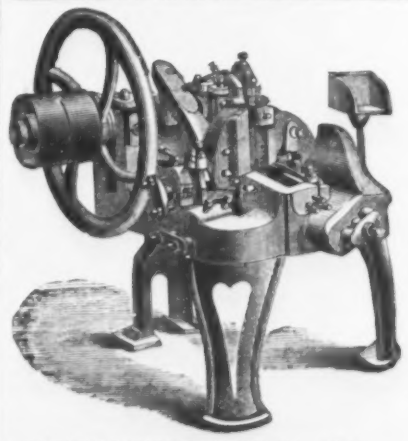

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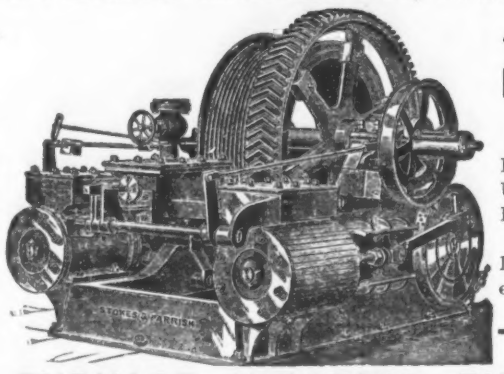

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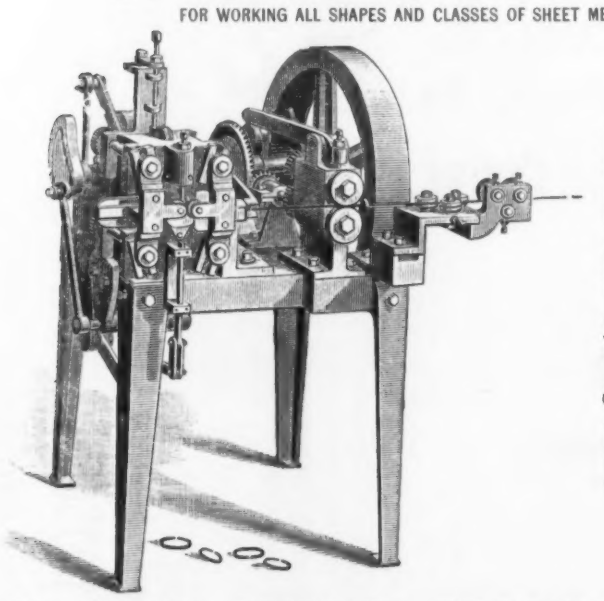

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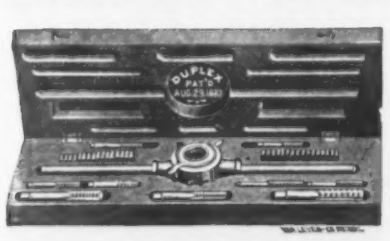

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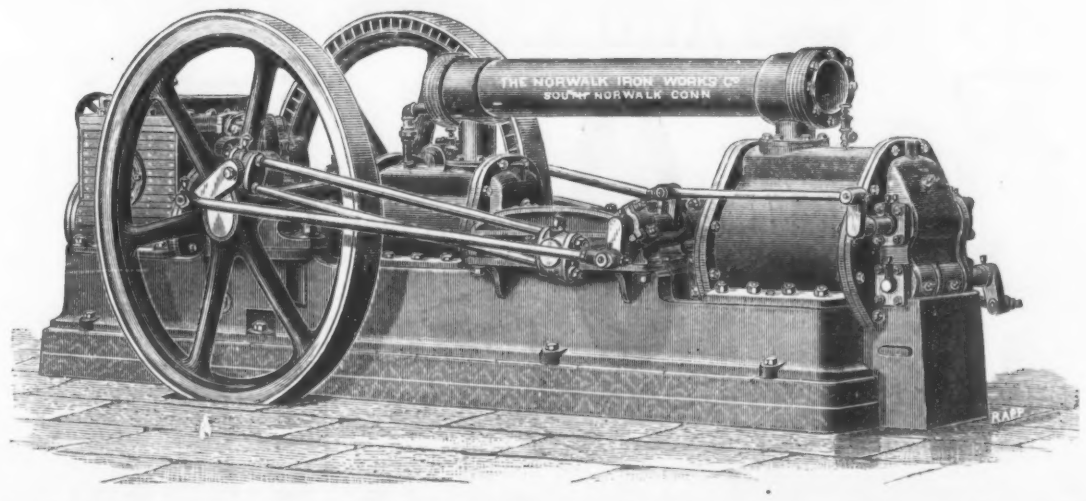

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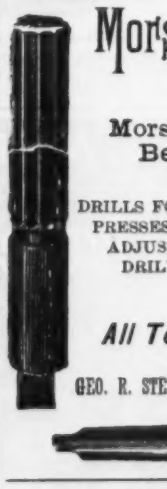

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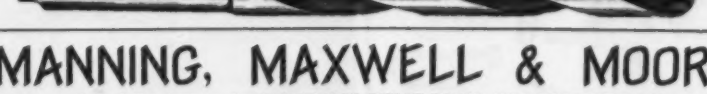

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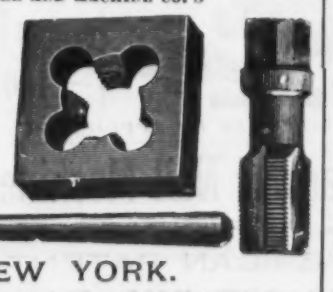

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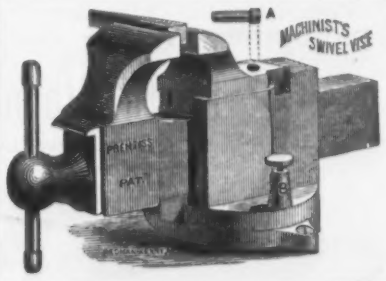

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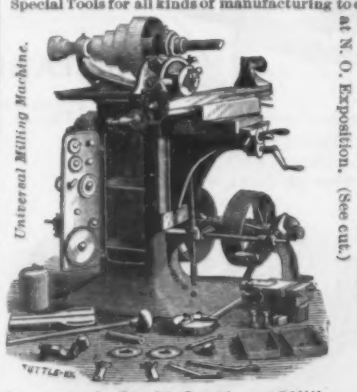

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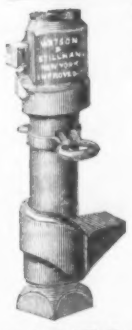

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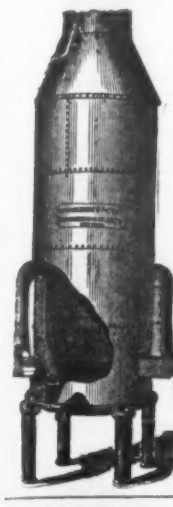

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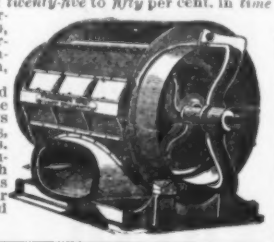

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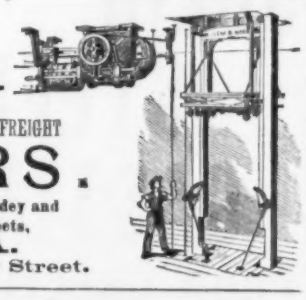

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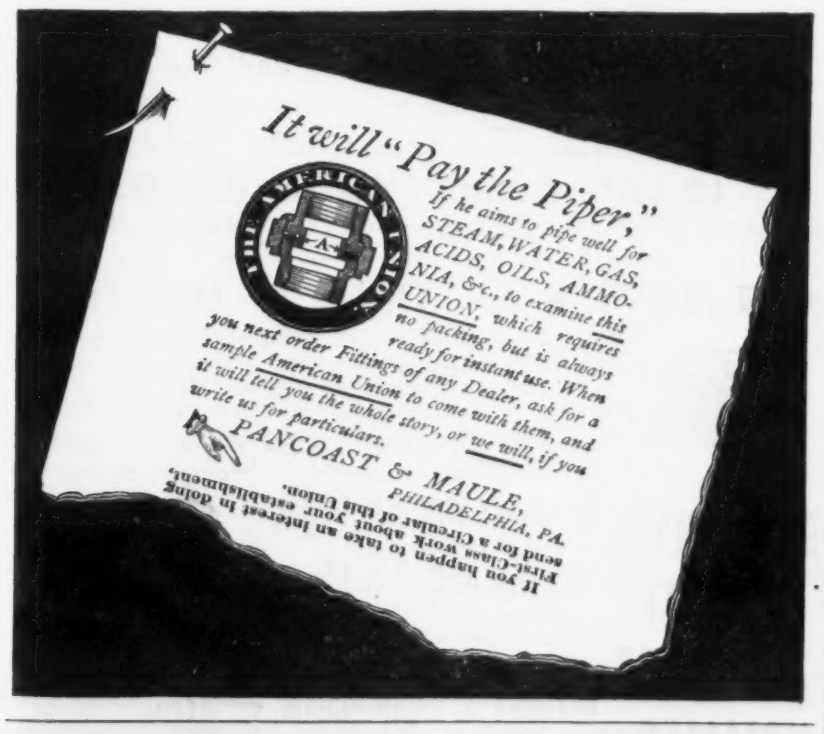

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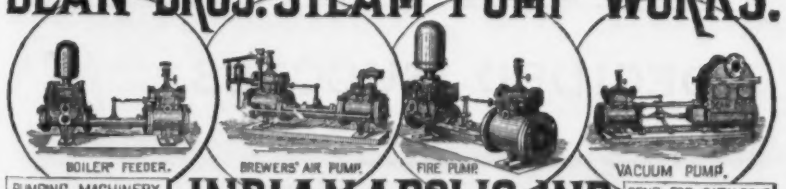

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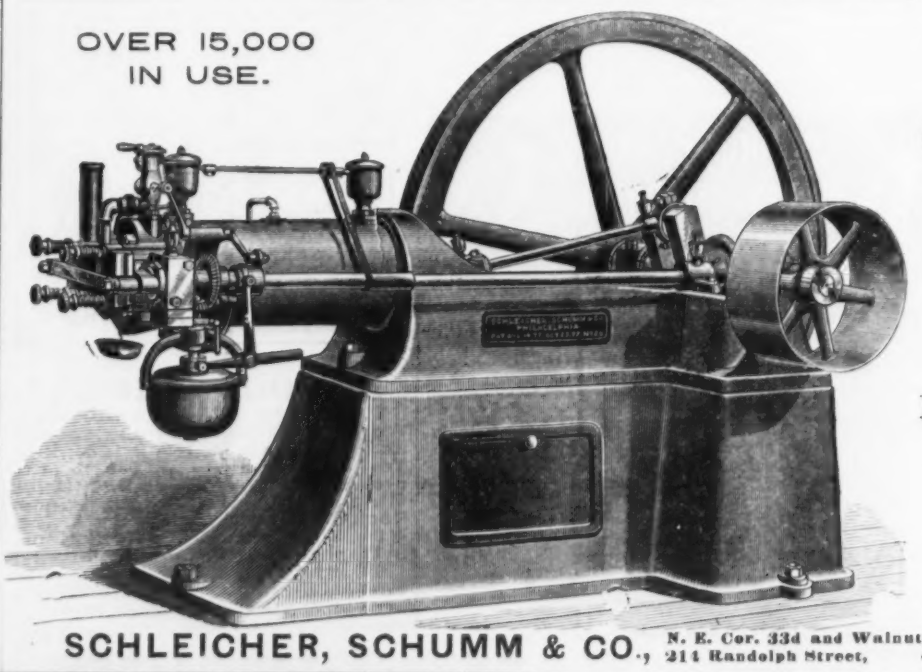

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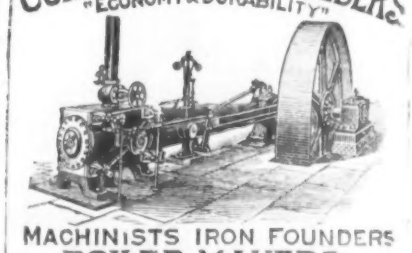

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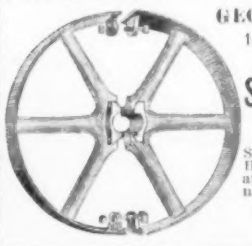

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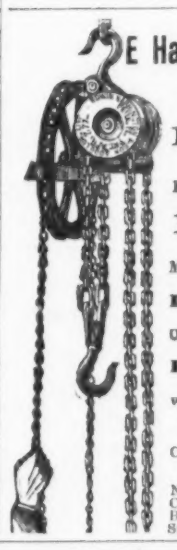

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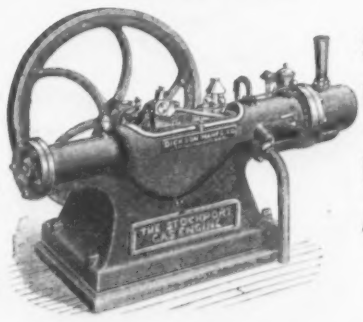

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